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ABSTRACT

The volume purports to define the structure and substance of special educational provisions offered to California gifted children (in the upper 2% of general mental ability). Following a review of California's program of special education for the gifted, the nature of special education for the gifted is defined in terms of principles, needs, and student and teacher behavioral objectives. Content, concepts, and learning tasks in the various subject areas and grade levels are summarized. Critical issues in the education of the gifted examined include both societal and school-related issues. Discussion of the evaluation of curriculum and instruction covers goals and problems of program evaluation, and assessment of characteristics of the gifted. (KW)

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PRINCIPLES, OBJECTIVES, AND CURRICULA FOR PROGRAMS IN THE

education of mentally gifted minors

KINDERGARTEN THROUGH GRADE TWELVE

EC 041514E

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PRINCIPLES, OBJECTIVES, AND CURRICULA FOR PROGRAMS IN THE

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Kindergarten Through
Grade Twelve

U.S. DEPARTMENT OF HEALTH,
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FOREWORD

To suppose that talented young people can mature easily "on their own" is, at best, debatable. The results of research conducted over the past 50 years show that gifted youth who have little or no direction often scatter their gifts and waste their powers. Thus, the talents of many of them are often lost to society.

As Thoreau observed, "It takes two to speak the truth – one to speak and another to hear." The education of our children still demands the essential give-and-take of two people: teacher and learner. And this requirement applies to children everywhere, because it is the nature of man to learn, step by step, with the help of his fellows. He does not acquire "instant" knowledge in isolation. Gifted boys and girls are no exception. Certainly, they differ from the average. But they are not devoid of fundamental needs; they, too, need to be taught and guided.

It is a precious gift that each of these specially endowed youth bears within himself. We educators have the very real responsibility of helping the gifted child move with strength and insight toward realizing his potential. If we fail to do this, our society suffers in incalculable ways.

This publication, then, is a serious venture. It is addressed to teachers, administrators, counselors, and others in a statewide effort to develop a useful framework for the education of gifted children. I encourage all persons interested in this critical segment of public education to send their reactions to the State Department of Education so that a framework of lasting value will be ensured.

Superintendent of Public Instruction

PREFACE

This preliminary publication is intended as a first step in preparing a framework for the education of gifted children and youth in California schools and for the nurture of talent wherever possible among the young people enrolled in these schools. The content in its present form does not necessarily represent state policy, nor should it be considered an approved or adopted model for program development. Allowing for minor editorial changes, the content is largely the same as that submitted by the contributors.

Persons who read this publication are invited to convey their critical comments and suggestions to the California State Department of Education. Particularly welcome would be constructive ideas for modifying the document in such ways as to make it a useful framework and a viable set of standards for planning and conducting educational programs for mentally gifted minors. Correspondence should be sent to Paul D. Plowman and Irving S. Sato, consultants in the education of the mentally gifted, California State Department of Education, no later than mid-January, 1972.

Objectives, Principles, and Curricula for Programs in the Education of Mentally Gifted Minors: Kindergarten Through Grade Twelve purports to define the structure and substance of special educational provisions offered to California children who are in the upper 2 percent of general mental ability. The preparation of this document was accomplished as one phase in a three-part project under Title V of the Elementary and Secondary Education Act.

Part I of the project, coordinated by Mary N. Meeker and James F. Magary of the University of Southern California, involved the development of this preliminary major work and a series of individual grade-range, subject-matter publications for administrators, consultants, and teachers. Part II of the project, directed by John C. Gowan with the assistance of Joyce Sonntag, both of San Fernando Valley State College, emphasized the preparation of exemplary curriculum guides for teachers at all grade levels. These guides include material pertaining to differentiated behavioral objectives, learning activities, and higher levels of thinking; and they

provide sample plans for units and lessons. A portion of Part III of the project was coordinated by Ronald L. Hunt, San Jose State College; Ralph Hoepfner, University of California, Los Angeles; and Mary N. Meeker, Loyola University of Los Angeles. Their work included the preparation of Chapter V, "Evaluation of Curriculum and Instruction for Gifted Students," in the present publication.

The utmost care was given to the planning and preparation of this significant forerunner edition. Because of this, the contributors are hopeful that further refinement will result in a framework which can be adopted and used as an effective policy statement in programs for mentally gifted minors. It is recognized that educating young individuals with special mental endowments is a clear responsibility of educators everywhere.

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"... to meet the needs of young people who are talented in skills other than in academic achievement, as well as the needs of those who are talented in academic areas."

By Way of Introduction

The goal of this publication is to establish a conceptual and procedural base which educators can use in developing and fostering programs uniquely appropriate for mentally gifted minors. Knowing the multifaceted nature of giftedness and the frailty of identification techniques, the writers have undergirded curriculum proposals with philosophical statements that encourage *differentiation* to meet the needs of young people who are talented in skills other than in academic achievement, as well as the needs of those who are talented in academic areas.

In order to achieve this goal, an attempt has been made to incorporate within this document certain commonalities among relevant theories. Chapter II, for that reason, is devoted to the rationale behind the selection of theories, to an explication of these theories and their commonalities, and to an overall scheme for relating the theories to the process and products of education for the gifted.

Chapter II, moreover, has a second focus. This preliminary publication suggests differentiation of curriculum based not upon administrative conveniences, such as the use of teaching machines, scheduling plans, and cluster arrangements or other kinds of grouping, but upon the individual needs of the child who is gifted. Thus, the first assumption made is that gifted children do indeed differ, no matter how similar their global IQ scores may be, and that their unique patterns of abilities can be assessed with valid psychometric tools. Predicated upon this assumption, then, the position can be taken that two disparate groups of educational personnel – those who are involved in curriculum services and those who perform psychological services – must cooperate in a joint effort to determine the child's pattern of giftedness so that the curriculum can be programmed around individual uniqueness. In other words, this document does not talk about "enrichment" or "acceleration" or other administrative methods for expediting the education of the gifted; rather, it pays close attention to the critical question, "How best can each gifted minor be educated?"

Today, research and its application make it possible within the confines of the typical school situation to identify and plan optimum programs for gifted children. Identification of different syndromes of giftedness allows us to develop curriculum that educates gifted children other than the academic-achiever type. Capitalizing upon current knowledge leads to a reduction of the lag between theory and its application in the schools.

One of the tasks of this pre-framework publication is that of challenging California educators to do more than give lip service to the worthy but tired statement that special education intended for the individual should be individualized. This publication also offers to those institutions that train educators some well-defined guidelines for developing teacher programs to handle the challenge of teaching gifted minors.

We, the coordinators and writers of this document, contend that the aspirations of talented children and youth are markedly influenced by their exposure to the educational system. In these pages, therefore, we have examined many ideas that guide people who educate the gifted. We have also carefully studied those two extremes in philosophy that are most commonly referred to: pragmatism and idealism. From this effort we have concluded that we can expect the gifted to choose for themselves where they want to stand – whether the place of their choice is at the one extreme where they equate the best with the most practical; or at the other extreme where, like Cervantes' Don Quixote, they reach for the unreachable stars; or somewhere in between.

CHAPTER I

California's Program of Special Education for Gifted Children and Youth

Special provisions for gifted children and youth demonstrate the concern of citizens, legislators, and educators for giving young people of school age the opportunities they need for developing their own capabilities and talents. These provisions contribute to the fulfillment of individuals as responsible, creative human beings; to the strengthening of our democratic society; and to the improvement of our way of life.

Differentiated programs for gifted children fit within the spectrum of specialized treatment for all children who have special learning needs. These programs are logical manifestations of our concern for individual differences, for equality of educational opportunity, and for the optimal development of each child. By treating and educating the gifted as a group with identifiable differences (capabilities, interests, and needs), teachers and school administrators can render help and services of immeasurable value. These leaders can tailor educational programs to fit the individual needs of talented boys and girls and at the same time include experiences to develop their problem-solving and creative abilities.

Some Backgrounds

To promote the intellectual and creative growth of individuals and to strengthen the leadership and professional personnel resources of the state, the California State Legislature sponsored an extensive three-year study (1957–1960) of 17 different programs in which the following elements were carefully researched: (1) characteristics of gifted children and youth; (2) effectiveness of programs; and (3) the cost of programs for the gifted. A key finding of the study was that gifted young people in special programs made significant gains in

academic achievement and in personal development. This research became the basis for recommending state reimbursement of excess expenses of such programs. Although the amount of money needed for identifying mentally gifted minors and for providing special programs for them was established at $250 per mentally gifted minor for a school year, only $40 per mentally gifted minor was made available for this task. Identification costs alone often approximated or exceeded this amount. Despite inadequate financial support, however, pupil participation rose from 38,000 the first year (1961-62) to more than 100,000 by 1968. Of necessity the programs that were developed involved little extra expense to school districts. Often the expenditures consisted only of buying a few extra books for children or of requesting consultants to provide training services for teachers. Some mentally gifted minors were placed in enrichment situations within the regular classroom; others were involved in correspondence programs or were given special tutoring, accelerated work, or counseling. Additional options included seminar and special-class programs.

The limited funds did not permit comprehensive program improvement – an enterprise that would have included developing a framework for the education of gifted children, a series of exemplary curriculum guides, and instruments and guidelines for curriculum evaluation.

California Project Talent

Because of the lack of state funds for developing and demonstrating noteworthy programs, the two consultants in the education of the mentally gifted in the State Department of Education applied for and received $250,000 in federal funds to be used for these program purposes. California Project Talent, a three-year demonstration program (1963–1966), developed and presented four validated types of programs and also prepared publications and inservice education films. The films showed district personnel how to be deliberate, systematic, and effective in helping to develop the higher intellectual (thinking) skills that characterize and augment the uniqueness of gifted children. These are the skills we must assure for the gifted if they are to develop into the leaders and professional human resources desired by California and the nation as a whole. With these skills the gifted child can become a productive and competent individual; and the benefits of his accomplishments would accrue to the state and to the nation as well as to himself.

Regarding the four demonstration programs conducted by California Project Talent, Rice (1965)[1] had this to say:

> Currently being offered in California schools, the four major program prototypes for gifted pupils and the approximate percent distribution of enrollment in them follow: (1) enrichment programs in the regular classroom, 52 percent; (2) special classes, 25 percent; (3) special counseling or instructional situations outside the regular classroom, 10 percent; and (4) advanced classes or acceleration programs, 10 percent.

Current Status of Special Education for the Gifted

During the 1968-69 fiscal year, a federal grant of $85,000 was received by the California State Department of Education to develop the following: a tentative framework on objectives, principles, and curricula for programs in the education of mentally gifted minors; subject-based materials for educational administrators and consultants; and a series of exemplary curriculum guides for teachers. These products are intended as sources of general standards and models for school districts to use either as described or in modified form, so that educational programming for gifted populations will be as well founded as knowledge permits today. Moreover, school districts will be in a better position to assure parents, the community, and the State Legislature that each gifted young person will have opportunities to acquire the knowledge and skills which will benefit him as an individual and as a productive and contributing member of society.

Benefits from programs for gifted children extend to other children as well. School district personnel throughout California have stated that their efforts in developing and maintaining programs for gifted minors have resulted in improvement of the total educational programs of the districts. This improvement has come about and can continue to come about because of careful identification of children with certain characteristics and abilities as well as from the placement of these children in suitable programs.

School districts have had not only to specify objectives and plan special facilities and provisions but also to determine how such programs would be evaluated. Inservice education has become a necessity – both to help teachers understand the gifted child and to

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[1]Throughout this document any internal reference is indicated by the author's last name, followed by the year of publication in parentheses. If no name is available, part or all of the title of the work is shown in italics, with the year date following in the usual manner. Complete bibliographical information for all sources cited in the text is provided in the list of "Selected References" at the back of this document.

enable them to motivate and facilitate the development of analytical, evaluative, and creative skills.

These efforts on behalf of the most academically able children promise to lend strength to every aspect of life within the state and region in which they may one day reside. These efforts also match educational practice with some of the basic precepts of American democracy. In 1962 an expression of appreciation for the social significance of this kind of enterprise came from one group of educators, the Southern Regional Education Board. This group described such an enterprise as an "article of faith" in differential education:

> . . . The promise to identify larger numbers of talented youngsters, to improve upon their education, and to launch them earlier into productive adult occupations – has been established by school systems scattered across the nation. These educational institutions have shown that where giftedness is systematically sought after and encouraged, it flourishes both in quality and quantity. They have shown that educational programs can be devised which not only broaden and deepen the gifted child's experience, but also permit him to move more rapidly through the extended years in the contemporary schools and into those creative and productive levels of science, art, and professional practice through which human welfare is advanced.
>
> Through this logic, the participants in the Southern Regional Project for Education of Gifted are convinced that special education for the gifted is socially mandatory, psychologically sound, and educationally feasible. [*The Gifted Student: A Manual for Program Improvement* (1962), p. 23.]

Purpose of This Publication

In preparing this preliminary publication, a broadly representative group of specialists and authorities have attempted to provide a general standard for gifted-child education in California.

Toward this end, *Objectives, Principles, and Curricula for Programs in the Education of Mentally Gifted Minors* defines the nature of gifted children, defines the nature of special education for gifted children, bases components of curriculum for the gifted upon theoretical commonalities, derives principles of curriculum for the gifted in kindergarten and in grades one through twelve, states general objectives to be sought, reviews crucial issues, and discusses the evaluation of curriculum and instruction for gifted minors.

Hopefully, educators who use the suggestions made in this document will find ways to nourish the thinking and creative abilities of talented children and youth and to strengthen educational programs for them. If these tasks are accomplished, the best possible programs will be developed for gifted enrollees in California schools.

The Social Promise of Special Education for the Gifted

It has been suggested that the recognition of individual differences among children and the attempt to educate each child in terms of his own strengths and potentialities are key features of democratic American educational practice. The fact that children with handicaps, whether mental or physical, have certain uncommon needs has been recognized for decades. Special educational provisions are necessary for them if they are to attain personal adequacy and effective participation in home and community life. On the other hand, boys and girls who manifest superior abilities to learn and perform have equally important *needs* for special education provisions – indeed, uncommon needs arising from the particular ways in which these young people differ from others. The need of the gifted child to exercise his capacity and to grow at his own rate is at least as intense as that of the child who develops slowly and is limited or handicapped in potential.

Although society generally recognizes the needs of students who are physically or mentally handicapped and is therefore willing to make special education provisions for them, the needs of students who deviate upward from the mean have been generally untended. It is necessary to state here that, in fact, the attitudes of the community, of professional educators, and even of parents have sometimes been less than positive (because of misunderstanding) and not infrequently have been characterized by hostility to the idea of doing things in particular for children and youth who apparently have so much "going for them" already.

Evidence of the special needs of the gifted child is subtle and relatively inconspicuous. Generally a gifted child will not disturb classroom progress unless he has social problems independent of his giftedness. A possible exception wherein classroom progress is disrupted by a gifted child occurs when the child is gifted with verbal fluency, and then perhaps only if he has not had adequate opportunity for expression of this verbal fluency in other settings. Because there is some difficulty in making necessary and desirable curricular adaptations to the special needs of the gifted child and because the gifted child poses no special problem to usual classroom procedure, the American school, to a great extent, has neglected him.

It must be noted, nevertheless, that this attitude has not been typical of laws passed in California (see the Education Code). It has been the intent of this state's governing bodies and of numerous school districts in the state to make special provisions for the gifted.

California lawmakers and educators are widely recognized by authorities in this field of education for their efforts on behalf of bright and talented children. It is also apparent, however, to educational scholars and behavioral scientists that much more effort is necessary (even in California and in other states that are actively engaged in this work) if Americans across the land are to recognize and develop suitable educational provisions for the full range and diversity of the gifted child's capabilities.

The task of effectively providing for the education of gifted children and youth requires major changes in concepts and in practice. Inseparable from this task is the demand that all pertinent objectives of differential education for the gifted be specifically formulated. Obviously and importantly, the implementation of these objectives calls for a transformed curriculum, as well as for (1) modification in the typical organization of the school day; (2) tailored instructional materials and methods; (3) specialized teacher preparation and specific teacher selection; and (4) education of the community for sustained cooperation, understanding, and support. None of these plans is easy to carry out, and what is even more difficult to confront is the fact that one plan alone is not enough. The essential challenge here is to put these plans into practice as soon and as effectively as possible.

Summary

Periodically in the history of education, certain goals take precedence over others. At the present time a recognition of California's need for future leaders who will bring highly developed critical and creative thinking abilities to their tasks is steadily growing. This recognition is providing a climate in which increased attention to the special educational needs of future leaders will be welcomed by the citizens of this state.

CHAPTER II

The Nature of Special Education for the Gifted

As early as 1926 Leta Hollingworth, a pioneer scholar in the field of studying problems involved in the education of the gifted, asked: "How shall a democracy educate its most educable?" and added, "There is no more important question in all American education."[1]

Restated for the exigencies of today's society, the questions might well be: Where will our political leaders come from? Where will we find intellectual leaders who will master, to the benefit of all, the store of knowledge that prompts computerization? Where will the ideas come from to solve social issues, atmospheric crises, resource problems? Who will make comprehensible systems out of the smaller systems exploding from technology? In the past, great ideas have always come from the gifted, but there is one major difference between the past and the present: in the past, great ideas flourished generally at random; in the present they must be cultivated. In the past, important concepts occurred for the most part in random centuries and led to "discoveries" that were made by a few of the educated elite. Today there is such a wealth of knowledge that men must learn to cultivate ideas. This difference between the past and the present can be resolved through systematic and planned educational programs for the gifted.

Programs for the gifted are guided by many considerations, among which are the following:

1. The individual potentialities and competencies of the learners
2. Contemporary and projected sociological and technical conditions
3. Community resources
4. Community expectations
5. Professional concerns of teachers
6. Commitment to fulfillment for the individual

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[1]See her 1942 book listed in the Selected References.

In past centuries education had little need to be concerned with the individual, but today each of the considerations identified here plays an integral role in leading to full educational experience. If the content of curriculum for the gifted is to lead to educational experience and to a consequent cultivation of ideas, the content must be specifically selected to integrate factual learning with thought processes and conceptual learning with motivation. Subject matter must be allowed to transcend traditional subject boundaries if content is to be employed to enhance the development of internal motivation, higher-level affective functions, and cognitive processes. The ability to span concepts across factual content is a characteristic well known to educators who work with the gifted student. This characteristic of his is also that unmeasurable "light" that sets him apart from his classmates. An integration of his ability with the organization of the curriculum, therefore, will contribute to and lead to the actualization of individual productivity.

Principles Underlying Curriculum and Instruction

Daily, common practice in schools provides but a small amount of long-range direction. Programs and methods are often dictated by exigencies, sporadic attention, and highly localized beliefs. Under these conditions, which are pervasive, many of the programs for gifted minors are fragmentary. They are intensifications or extensions of the general curriculum. Departures into carefully planned adaptations of established curricula are few. Longitudinal programs from kindergarten through grade twelve are almost nonexistent; and curricula for the gifted differing from tradition and based on radical or fundamental principles are rare.

Social Factors Influencing the Education of the Gifted

Social and technological conditions are decisive factors in the selection of educational materials and instructional methods for the gifted. Contemporary society is markedly metropolitan; work is increasingly specialized and automated; management and control are largely bureaucratic and are often more responsive to opinions of groups than to individual voices.

The Identification of Gifted Children

As defined in California, mentally gifted minors are children in the upper 2 percent of general mental ability at their grade level throughout the state. Special programs developed over the past six years in California have been directed toward educating these

students. This publication has been planned and prepared with the sole aim of helping to meet the needs of these children and youth

It is wise to recognize that when we concern ourselves with special education for the gifted, we are *not* considering the typical superior student (115-125 IQ score) who is so frequently an excellent scholar and who can, with adequate effort, earn A grades and achieve and receive academic honors. Special education programs for the gifted (132+) must be planned for the *qualitatively* unique talented student who is perhaps as far from the superior (115-125) in potential as the superior is from the average (90-115). The gifted student's talent may lie in one or several academic fields, and it often does; but his talent may also be a unique ability with respect to a certain aptitude or in connection with one cognitive, perceptual, or affective area. What educators must recognize is that his specific talent or, for that matter, outstanding general ability, may or may not be reflected in academic achievement as anticipated by test scores or measured capabilities. A special education program for the gifted, predicated upon this simple recognition, may very well salvage the human potential that is lost when the system either does not recognize or does not accommodate talent.

The important factor of *uniqueness* among the gifted, nevertheless, *does not preclude* the need to examine significant, outstanding theories about intelligence, learning, and knowledge in order to identify certain commonalities that can serve as a kind of foundation for principles of education for talented minors.

Some General Characteristics of Gifted Children

Observant teachers can spot unique and specialized responses, both in the classroom and on the playground, that differentiate the gifted child from the rest of his classmates. He is likely to possess the following abilities:

1. To read earlier and with greater comprehension of nuances in the language. Kindergarten teachers need to discover which few of their pupils read books and already have library cards.
2. To learn basic skills better. The gifted child usually learns them faster and needs less practice. Overlearning can lead to boredom, cessation of motivation, and the commission of careless errors.[2]

[2]What is said under number 2 does not imply that practice is unnecessary. Indeed, gifted children should practice such skills as grammar, spelling, and handwriting according to each child's need to enhance his educational progress, to experience self-discipline, and to sharpen his ability to communicate with others.

3. To make abstractions when other children at the same age level cannot
4. To delve into some interests beyond the usual limitations of childhood
5. To comprehend, with almost nonverbal cues, implications which other children need to have "spelled out" for them. The gifted gouge out a greater amount of information and do so faster. (See Figure 2 in this chapter.)
6. To take direction independently at an earlier stage in life and to assume responsibility more naturally
7. To maintain much longer concentration periods. Gifted young people become immersed with the facts and content of knowledge.
8. To express thoughts readily and to communicate with clarity in one or more areas of talent, whether verbal, numerical, aptitudinal, or affective
9. To read widely, quickly, and intensely in one subject or in many areas
10. To expend seemingly limitless energy
11. To manifest creative and original verbal or motor responses
12. To demonstrate a more complex processing of information than the average child of the same age
13. To respond and relate well to peers, parents, teachers, and adults who likewise function easily in the higher-level thinking processes
14. To have many projects going, particularly at home, so that the talented child is either busily occupied or looking for something to do
15. To assume leadership roles because the innate sense of justice that is often noticeable in gifted children and youth gives them strength to which other young people respond

Some General Needs of Gifted Children

The qualitative differences of the gifted listed in the foregoing are signposts to educators. The characteristics identified in the list point up some universal and fundamental needs which special educational procedure can meet, and some of these needs can be met in the classroom.

Aids to Learning

The gifted young person can be helped to meet his needs by the following:

1. Independent working periods
2. Exposure to large bodies of knowledge and facts
3. In the early stages of learning and when grade-level proficiency is demonstrated, less work and less time spent on performance-based instruction in arithmetic, grammar, spelling, handwriting, punctuation, and other basic skills[3]
4. Ample opportunity to interact in school situations with adults who recognize that the gifted child sometimes requires more freedom, less control, and sufficient time to make discoveries
5. Fewer grade (or quantitative) boundaries on work loads
6. Assessment procedures that reveal the unique giftedness of each individual
7. Programs designed to enhance the gifted young person's uniqueness or to overcome his weaknesses if they are fundamental to successful performance. Evaluations made of his special abilities must be detailed in such a manner that the teacher is secure in making adaptations.
8. Specific "how to" skills that make for economical mastery of the child's knowledge and production; for example:
   a. Using library systems to aid his researching
   b. Typing
   c. Doing scan reading and, later, speed reading
   d. Outlining, abstracting, synthesizing
   e. Being exposed to and taught simple computer languages
   f. Being taught the basic and vernacular vocabulary of special disciplines in which he is interested
   g. Given classification experiences as a basis for primitive organizational structures

   It would be unrealistic to think that gifted pupils cannot master fundamentals of these specific "how to" skills during the primary grades. Field testing has shown repeatedly that they are capable of doing so.

A Positive Approach to Helping the Gifted

With regard to number 3 in the preceding list of aids to learning, the following comments should be pertinent:

Knowledgeable educators recognize that the gifted pupil can go much faster than the ordinary child. They realize that to slow down

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[3]See footnote 2 in this chapter and also the commentary that immediately follows this listing.

this pupil by forcing neat handwriting or perfect spelling in the early learning stages may take its toll by dampening his love for school and curtailing his motivation to learn. His teacher needs to have faith in two things: First, the gifted child can spell anything phonetically; with practice, good spelling and handwriting will come. Here we can draw an analogy from learning to play golf. To be slowed down and consistently forced to make every drive mechanically perfect will in the long run either snuff out the desire to play or delay perfection of a natural swing. Second, the gifted child is reasonable and can accept times, places, and conditions in which correct performance (e.g., in spelling, penmanship, grammar, computation) is necessary. If the educational system is so inflexible that it holds the gifted young person to standards intended for the nongifted learner, then the needs for the gifted boy or girl for chunks of meaningful learning and production are not likely to be met.

On the other hand, to say that flexibility in the early phases of education is important does not mean to imply that basic mental or motor skills are useless to the gifted child or that they should be glossed over. Indeed, talented young people must often communicate with other persons, and their talents may not be recognized or appreciated if manifested in gross misspellings or in illegible, poorly spoken, or fuzzily reasoned ways. Some psychologists, educators, and other professional people maintain that there is a carry-over from sloppy habits of writing and grammar to sloppy habits of thinking and performing. Some artists, both in this country and abroad, feel strongly that discipline in "the basics" enables them to be more creative. Still other persons look upon self-discipline as a help, not a hindrance, to self-expression.

There are many facets to this difficult problem of how much strengthening of basic performance the gifted learner should have and when he should have it. The words "drill" and "practice" are offensive to many teachers and administrators today, and yet few would deny that a certain measure of reinforcement is necessary to any learner and that the amount or extent of reinforcement depends largely upon the capacity and the capabilities of the individual learner.

Perhaps the key to solving this problem is to use and maintain a positive approach in teaching and guiding gifted children. That is to say, the native creativity and spontaneity so characteristic of the talented young person should always be encouraged, fostered, and appreciated in the educational environment and should be given priority value. This positive outlook is particularly important in the

early days of the gifted child's learning experiences. The child needs to know, first of all, that he can make creative contributions without fear of being checkreined or disparaged. He will welcome intelligent guidance from his teacher, but he will not welcome a closing of doors on his own natural drive to explore and to originate. As the child gets used to this receptive environment and grows increasingly comfortable and confident in the exercise of his talents, he can take the time to reinforce the basic skills of learning and be given whatever guidance he needs in this reinforcement.

The positive approach assumes that creativity should come first – then the practice of basic skills. In this view, neither creativity nor reinforcement is held suspect. Rather, a priority of order in the process of learning is recommended so that each individual will be allowed to use his unique gifts in a natural way. Regimentation is never the answer. Guidance is often needed. Freedom to be one's self is indispensable.

The Fulfillment of Human Talent

There is *purpose* behind that type of education which recognizes needs based on gifted uniqueness and which invests, accordingly, in programs for special education. Maximal return of society's investment in its potential resources will be realized; and for its investment, the gains are unmeasurable in terms of salvaging human talent. The fulfillment of human talent leads to a mental adjustment out of which genuine contributions to society are created.

This chapter has described characteristics typifying gifted children, has listed needs arising from their uniqueness, and has identified certain ways of meeting their needs. Although the needs necessarily warrant a special approach to programs for the gifted, they are not sufficient unto themselves for the establishment of basic principles that must undergird excellent educational practice.

According to Plowman (1967), if a major aim in the education of the mentally gifted minor is to promote growth toward self-directed learning, then it is necessary that gifted boys and girls be helped:

1. To acquire knowledge significant to them in the natural sciences, the social sciences, the humanities, mathematics, and the fine arts
2. To internalize learning processes important to them
3. To use this knowledge and these processes rationally and creatively
4. To become better human beings and more productive members of society as a result of their academic experiences

The Search for Principles of Educating the Gifted

Some partially tested theories from which principles for educating the gifted may be derived have been developed in recent times. However, none of these theories has been so firmly demonstrated or accepted that it should be offered as the only basis for an effective system of educating talented children and youth. Although these theories circumscribe differing dimensions of human activity, they are generally applicable to educational practice. The theories selected for the present document fall into three areas of investigation:

1. The psychology of intelligence (as approached by J. P. Guilford and by Jean Piaget)
2. The classification of knowledge (as developed by Benjamin Bloom and David Krathwohl and their associates and by Philip H. Phenix)
3. Classroom studies of the learning process (as fostered and conducted by many professional scholars interested in the phenomenon of the human memory and in the modification of human behavior)

Persons who make special efforts to deal with the complex aspects of creative learning may find guidance in any one of the systems proposed within these three areas. Although a review of the major conceptualizations is necessarily limited here, a brief treatment of selected ideas may encourage the reader to explore further. Even in this brief treatment, it should be possible to indicate certain commonalities among these theories from which principles for educational planning may be acquired and put to good use in helping the talented.

The Psychology of Intelligence

Experts continue to dispute an issue that came into prominence in the early 1900s: Is intelligence a unitary, overreaching function? Does it relate to a few broad competencies functioning under the management of an overarching g-factor?[4] Does it involve an accumulation of competencies each of which may be developed independently at any time?

Despite the persistent bafflement, some well-demonstrated findings regarding intelligence have emerged. Among these are the following:

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[4]As used here, the g-factor refers to the "general factor" in Spearman's two-factor theory of intelligence. It symbolizes the general abilities of a given person, whereas the s-factor symbolizes his specific abilities. See *Dictionary of Education* (1959), p. 248.

- Manifestations of intelligence are intensely related to experience, particularly to early childhood language experience.
- IQ scores are quantitative measures based either on the encoding of auditory perceptions or on visual perceptions, but rarely on both equally.
- IQ scores reflect almost wholly an ability to comprehend vocabulary and to manipulate language meanings.
- The IQ score is more a threshold variable than it is a predictor of performance.
- Different IQ tests measure differing abilities and thus give rise to fluctuating IQ scores.

Guilford. In recent years several models have been used to conceptualize intelligence. J. P. Guilford, of the University of Southern California, developed a three-dimensional model which he called the "Structure of Intellect."[5] It emerged over a period of years during which measurements of intellectual abilities of innumerable students were subjected to factor analysis. He found that the intellectual factors consistently arranged themselves into three patterns or parameters. These he named operations, contents, and products. He also found that certain major categories of factors manifested themselves within each of the broad patterns. Guilford's concepts about the structure of the intellect may be described briefly as follows:

1. The first and major pattern consists of *operations* (kinds of abilities). According to test results, there are five primary divisions of intellectual operations. That is to say, each operation is based on an ability to perform a task involving cognition, memory, divergent thinking, convergent thinking, or evaluation.

2. Tasks within the operations, forming a second pattern, are found to be composed of a figural content (as in the nature of a gestalt – for example, a picture of a tree), or of a symbolic content (numerals or notes of music), or of a semantic content (words and ideas). These factors are labeled *contents* (or the material of which tasks are composed).

3. Then, depending on how the content is organized, a third pattern emerges. Each operational content can be *produced* as a single unit, as a classification, as a relation, as a system, as a transformation, or as an implication. The manner in which any task can be described by its three patterns is illustrated in Figure 1.

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[5]See Guilford and Merrifield (1960) and Guilford (1967).

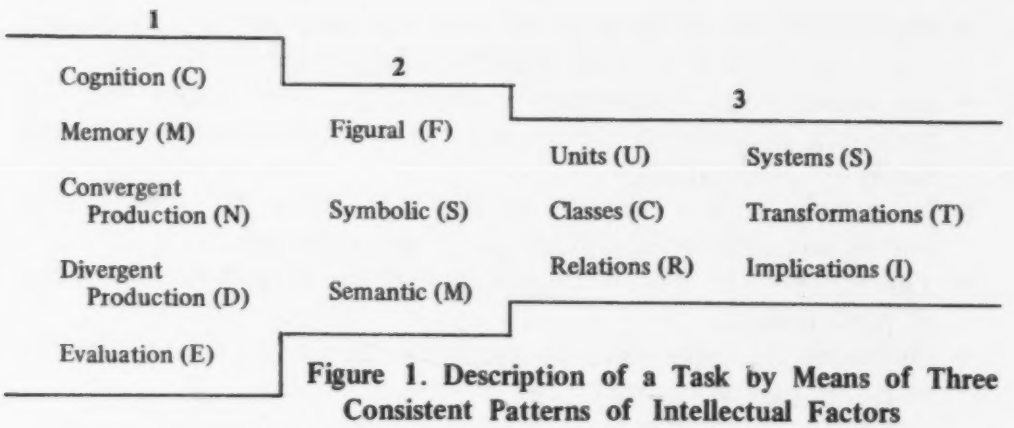

Figure 1. Description of a Task by Means of Three Consistent Patterns of Intellectual Factors

From this graphic aid, it can be seen that any ability can be described by three letters, reading from left to right. An example is CFU or Cognition of a Figural Unit (the ability to comprehend a single gestalt), which is one of 120 possible abilities.

Better known is CMU, Cognition of a Semantic Unit, or *vocabulary*. Vocabulary, nevertheless, is only one of 120 predicted abilities, and this fact should make it apparent to the reader why many educators have been disturbed by unexplained variations of IQ scores.

Presumably a model such as the "Structure of Intellect" does organize observations about ability and, as such, may be used to make explicit and systematic arrangements for education. This model has been utilized by Meeker (1969) (1) to define teaching goals and sequence; (2) to analyze the protocols of standardized IQ tests; and (3) to serve as a basis for developing programs for individual students. Specifically applied to the gifted, the Guilford model defines the more complex "products," or ways of organizing information (such as systems, transformations, and implications), as well as the more abstract cognitive abilities or "operations" of divergent thinking and evaluation. Investigations into the use of "divergent production" tasks with the gifted have been well documented by Torrance (1965), Gallagher (1964), Bruch (1965), and Ridler (1968).

Piaget. A second method of investigating intelligence is that developed by the Swiss psychologist, Jean Piaget, in his study of the ways in which children make an acquisition of knowledge.[6] In this

[6]Several Piaget titles are included in the Selected References for this publication. See especially the article in the *Journal of Educational Psychology* (December, 1961).

inquirer's scheme, intelligence develops sequentially and hierarchically as the child interacts with his environment during his maturation. Each new level is achieved after his assimilation of information acquired at a lower level. Early in life a child is capable only of preoperational and concrete thinking; that is, he cannot generalize beyond the known and yet hold the abstract referent in mind. Most educators know this stage well. It has often been called "the here and now" stage. With stimulation and maturation, the child gradually becomes capable of synthesizing abstract information (formal thinking). Such growth comes about by assimilation of confirming experiences and by accommodation to dissonant experiences. In Piagetian theory, evolution of intelligence from stage to stage is dependent on experience. Educational applications of the Piaget model are reported extensively in American publications prepared by the Society for Research in Child Development. Moreover, Celia Stendler (1964) has produced instructional films about child levels in the Piaget model.

Without diminishing the distinctions between these views, it is reasonable to conclude that although Guilford and Piaget organize intelligence on two different sets of dimensions, both support a delineation of intellectual processes. If, as stated previously, the aim of special education for the gifted is the development of the higher processes and functions, then we need to make a precise selection of growth-fostering activities as defined by the Piaget and Guilford investigations. The studies of these men have been thoroughly documented, and principles of education derived from them are well supported by the documentations.

The Organization and Classification of Knowledge

Phenix. One major theorist, Philip Phenix (1964), looks upon the goal of education as being the fullest realization of human capacity. To realize meanings (reasoning) is the essence of humanness, and Phenix has organized these meanings sequentially from simple to complex in the following manner:

Sequence of the Curriculum

	Body of meanings	*Curriculum counterparts*
Early	Symbolics	Mathematics and language
↓	Empirics	Sciences
to	Aesthetics	Arts
↓	Synoetics	Personal knowledge of self
Late	Ethics	Moral meanings and human obligations
	Synoptics	History, religion, philosophy

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To accommodate himself fully in life, man must master each body of meaning temporally (and presumably at different depths), beginning with the simpler body of symbolics and finally, at maturity, mastering history, religion, and philosophy. Phenix suggests that the content of each curriculum counterpart be directed toward the following:

Using symbols	Relating
Abstracting	Making judgments
Generalizing	Reenacting the past
Creating	Seeking the ultimate
Perceiving	Analyzing, evaluating, synthesizing

The reader is referred to Phenix's *Realms of Meaning* (1964) for further study of his rationale and definitions.

The Taxonomy of Educational Objectives. Another approach to organizing knowledge comes from the work of Bloom, Krathwohl, and others (1956, 1964), who have imposed a hierarchy of levels of difficulty on the ordering of information. In this taxonomy the categories are proposed as objectives for the content in education with the goals ranging from the basic, which is *knowledge,* to the intricate, which is *evaluation,* in this manner:

Knowledge (acquisition and storage of basic facts)
Comprehension (ability to comprehend meaning of material)
Application (remembering and bringing to bear upon problems the appropriate generalizations)
Analysis (the breakdown of material into its constituent parts with understanding of their relationships)
Synthesis (a putting together of elements and parts to form a new whole)
Evaluation (making judgments about material for some purpose)

Within this system, then, educators who want to ensure full development of academic facileness would organize curriculum for any particular subject matter so that learners would have sequential experiences in all six categories. Gifted children, however, so often begin their school experience with skills at the upper levels that, in some disciplines, principles would dictate cognizance of these individual differences, and educators would necessarily plan accordingly.

In the specific task of educational planning for gifted children, the higher categories would receive more attention because, typically, gifted children would be more capable of responding at these higher levels. However, many gifted young people will be equally capable of superior performance in the lower-category skills and would prefer to

be inundated with facts and knowledge at the expense of any creative or exploratory experiences. (Certain "inquiry" approaches may actually hinder rather than help the gifted child who needs great amounts of knowledge quickly.) Although many gifted children are capable of insightful learning, others are not and must be taught evaluative skills specifically if they are ever to overcome the trial-and-error type of solutions to problems.

In a heuristic manner, therefore, these models have importance in planning and field-testing curriculum. At the very time that they offer potential bases for assessment of individual strengths and weaknesses, they help to delineate educational goals. In curriculum planning, a larger number of opportunities can be provided for the gifted in those categories, regardless of their place in the hierarchy, in which the student is most capable and most interested. Gifted children already have developed or will develop cognitive styles and expertise in ways of handling information. However, ascribing more weight to the higher categories is one way in which educators can facilitate creative experiences within academics.

Several advantages will accrue to educators of the gifted if commonalities among the theoretical positions can be demonstrated. Having special relevance for education, the commonalities fulfill certain important purposes. First, they lay a foundation from which good principles of special programs for the gifted can be derived. Second, they clarify delineations of intellectual tasks. Third, they serve as a basis for evaluations. And fourth, they pinpoint areas in which giftedness can be identified.

Here we are most particularly concerned with *how* these commonalities can be used to describe principles undergirding the development of human potential so that objectives will be solidly based. First of all, the commonalities imply a universal bond upon which intellectual assessments of the child's individual strengths and weaknesses can be based. Secondly, they can serve as objectives for content in the curriculum. Thirdly, they offer models that provide information about processes in intellectual functioning. Lastly, they may serve as guideposts both for the harnessing and channeling of interests and for vocational planning.

The Conditions of Learning

The two kinds of conceptualizations just reviewed (the psychology of intelligence and the classification of knowledge) are supplemented by investigations and measurements of *how children learn and how changes in performance occur.*

Field and situational studies of conditions for learning include much of the work of experts on the gifted; for example, that of Lewis Terman (1916, 1926), Leta Hollingworth (1942), and Paul Witty (1951). There are many other contributors. From the studies conducted by these persons, we have learned that (1) there are different syndromes of giftedness; (2) gifted children achieve differentially from one subject matter to another; (3) gifted children learn differentially when the teaching style is changed; (4) creativity declines or is rarely developed in highly conforming schools and communities or under the tutelage of rigid teachers; (5) children need some freedom from peer entanglement and teacher direction if they are to become self-directive and self-evaluative; (6) creatively gifted children comprise a small group within the larger gifted group and have differing values and personalities.

Situational and classroom studies reveal some common pitfalls, however. For example, instruction in science may emphasize speed, precision, logical thought, and evaluation but may neglect intuitive thought, imagination, and divergent thinking. Instruction in art, on the other hand, may neglect order and evaluation. Obviously, there is need for a comprehensively balanced instructional program that includes the numerous abilities essential for higher-level cognitive abilities.

The formal or more exact behavior modification studies (S-R operant conditioning and other adaptations) have contributed to principles for the teaching of less complex behavior to retarded, educationally handicapped, and neurologically handicapped students. Behavior modification procedures have been successfully used in teaching small increments or very simple tasks like attending, part-skill training, and some fundamentals of speech and reading. Formulations from these experiemental studies have not been tested in education for the gifted, because typically the gifted students will begin school with these abilities already well developed unless they have been exposed to traumatic emotional upheavals. Nevertheless, investigations into conditions for learning are vitally needed in education, and although behavior modification studies to date have had little direct relevance to education for the gifted, it is probable that the contributions from experimental studies of learning will aid in developing methodology and techniques.

One of the approaches that have to do with "conditions for learning" involves the so-called "errorless learning" technique. This type of learning is based on the assumption that success (rather than failure) in first trials leads to motivation to succeed. Among several

conditions being seriously studied in behavior motivation research today, errorless learning suggests the following points:

1. Learning that is free from error or failure tends to produce a good self- concept in the learner.
2. A good self-concept underlies a thirst for knowledge, motivation to learn, and some acts of creativity.
3. Studies of home environments, particularly those of the creatively gifted, often point to emotional conditions existing in the home that are similar to conditions in errorless learning. In such homes where children "fail safely" and have been respected for their individual decisions, these children appear to have developed good self-concepts.

On the other hand, the approach described in the foregoing is challenged by those behavioral researchists who contend that motivation to learn does not come from success or failure per se, but from the child's own nature. Opponents of "errorless learning" advance the following points:

1. Rather than to attempt to make the child's first efforts successful, it would be more appropriate – in accordance with the way the human organism learns – to teach him the value of negative results.
2. Failure is a learned concept. The child who learns to grasp, walk, speak, and so forth does not regard his initial efforts in the light of "failure." His first efforts are met, or should be met, with praise or correction from his beholders, not as successes or failures but as *efforts.*
3. It might be hypothecated that persons who put a high priority on freedom from error in their own behavior are not likely to risk creative ventures or "intuitive leaps."
4. Promoting the idea that it is important not to make mistakes may be less effective in terms of self-motivated learning than promoting the idea that negative results yield useful data.
5. The child can learn profitably from making mistakes. He learns to "fail safely" from the *experience of failing safely;* he discovers that the struggle involved in learning is often motivational and exciting despite the risk of committing errors.
6. Considerable evidence supports the point of view that it is better to give the child the opportunity to learn that errors are sources of valuable information than to program errors completely out of his learning experience.

It is important that the child and the teacher distinguish between success and lack of success in the performance of a task. However, the child must not be labeled a "failure" just because he is unable to perform a given task at a particular time, under certain conditions. Perhaps the time is not right; perhaps the conditions are unfavorable, or only partly favorable. Over a period of time, he should come to realize that sustained effort, not the inability to perform a task at a given time, is the real issue. After another try or still another, the child may quite likely succeed. His awareness and acceptance of both success and failure in his endeavors should contribute to his viewing subsequent tasks, challenges, and opportunities in a positive and rational manner.

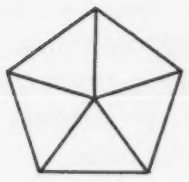
If specific techniques, general theories, and models are to be useful in education, then the information they provide must somehow be organized into a systematic framework. One way of accomplishing this organization is to search for commonalities that have practical value for special education for the gifted. Figure 2 relates to such commonalities. The model presented in this figure attempts to show how products may be seen to culminate from processes. The schema here would show the normal or expected development. With gifted children, however, the time it takes for learning or passing through the levels (processes) might be so shortened that some children would be found actualizing the higher-level kinds of products long before the expected time. (See opposite page.)

A Comprehensive Scheme for Programming Educational Provisions for Mentally Gifted Minors

The remainder of this chapter will be devoted to the derivation of principles and objectives that are relevant to special education for the gifted. To serve as a prelude, however, the summary chart shown here outlines how major elements of a total program can be organized. The adaptation of the Ward chart should bring into perspective and promote a clearer understanding of the following: identification of gifted children, column 1; development objectives, column 2; curriculum content, column 3a; skills, column 3b; and projected outcomes, column 4. It also offers a design for instructional processes in special education. With the permission of its author, the summary has been adapted for use in this publication from two sources: a paper presented before the Council for Exceptional Children (Ward, 1965) and a revised chart in connection with that paper (Ward, 1968) – both originated by Virgil S. Ward, University of Virginia. A brief explanation of the elements in the

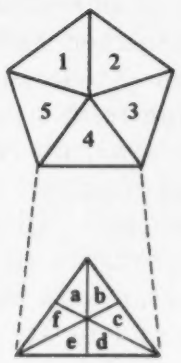
An Intellectual Response to Environment (IRE)

can be defined according to the way or ways information is processed.



Factors of IRE

There are five major operational abilities as factored by Guilford: cognition, memory, evaluation, convergent production, and divergent production. The words in parentheses are derived from Bloom, Krathwohl, and others.



1. COGNITION (COMPREHENSION)
2. MEMORY (KNOWLEDGE)
3. EVALUATION (ANALYSIS)
4. CONVERGENT PRODUCTION (APPLICATION-SYNTHESIS)
5. DIVERGENT PRODUCTION (APPLICATION-SYNTHESIS)

Organization of Knowledge

Within any one of the major operational abilities, the information is organized from simple to complex (Guilford).

The ability to do convergent thinking (*4* above) results in one of these six products.

a. UNITS
b. CLASSES
c. RELATIONS
d. SYSTEMS
e. TRANSFORMATIONS
f. IMPLICATIONS

Temporal Factors of Organized Material

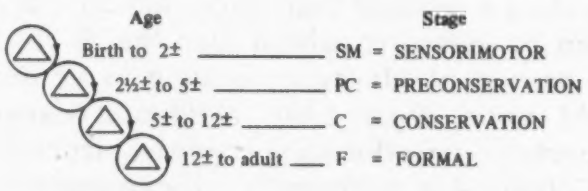
The Phenix hierarchy designates that the more simple curricular material (L) be taught before the more complicated (P);

that is, *a* through *e* above, of any major ability (1 through 5), ought to be presented first in Language (L), secondly in Mathematics (M), on through Personal Knowledge (P).

L = LANGUAGE
M = MATHEMATICS
S = SCIENCES
A = ARTS
P = PERSONAL KNOWLEDGE, MORAL MEANINGS, HISTORY, RELIGION, PHILOSOPHY

Level of Assimilation of Knowledge

Piaget, concerned with the basic intellectual processes underlying advanced knowledge, offers a time sequence for the order of difficulty of material.



The commonalities among these four models offer a psychological system for the development of curriculum and the sequence in which the curriculum is best presented.

Figure 2. A System of Commonalities Derived from Four Models of Education

NOTE: **The content of this schema was prepared by Mary Nacol Meeker; the graphics were rendered by Gloria Martin.**

total program as represented in the chart is provided here, but the reader is referred to the original sources for description and explanation in depth. (See opposite page for the chart.)

This schema brings a holistic organization to the demanding task of curriculum development. It renders explicit essential phases of differentiated experiential processes, and the relationships of each of these aspects are articulated sequentially across the rows.

The first column, "Types of potential," describes broad classes of gifted students. Type *a* is concerned with emotional constellations of giftedness; type *b* describes intellectual potential; and type *c* is concerned with gifts we often term special and perhaps even innate talents. These broad (or narrow), observable trait patterns help to prescribe specific educational practices.

The second column, labeled "Dimension to be developed," identifies the related characteristics to be developed. This column provides a bridge from the nature of a behavioral characteristic to the nature of specialized kinds of educational experiences. Two of the terms used require clarification as to the author's meaning: *conceptual development* is distinguished from *perceptual development.* The objective of *conceptual development* extends across the row to the processes involved in developing curriculum content (3a) and consequential skills (3b). Columns 3a and 3b cover the entire range of information that may come from school subjects and other media wherein factual knowledge originates and grows. *Perceptual development,* on the other hand, posits a structural difference, because of the impact of experience during the individual's earlier, preschool years upon the gifted organism. This impact helps to create within the child a residual that places him at a higher level of development when he comes to school than the child of average ability. That is, the process of education (column 3a, content, and column 3b, skills) build upon those early childhood experiences which have had importance in influencing cognitive structure or capacity.

Column 4 is sufficiently self-explanatory. It shows the final phase in the follow-through from a particular behavior or experience to the expected outcomes. Each segment of column 4, resorting to conventional conceptions of educational outcomes, involves only those essential differences inherent in the special education for the gifted.

In summary, the Ward chart contributes, besides utility, a systematic process from identification to goals. The row divisions are sequential and articulated, whereas the column divisions are parts of an integrated whole leading to total development for each type.

DIFFERENTIAL EDUCATION FOR THE GIFTED: A SUMMARY CHART OF ESSENTIAL FEATURES*

1 Types of potential	2 Dimension to be developed	3 Curriculum design Educational process involved 3a Developing content	3b Acquiring skills	4 Product: Goals and outcomes
Kinds of gifted children	*Personal development*	Value information; guidance/ therapy where emotional growth demands it; affective situational experiences; alternative solutions and evaluations; background for inductive thinking	Cognition and comprehension of situational experience; guidance involving motives and emotion; decision-making skills; deductive skills	Mature, healthy personality (actualizing potential) with constructive and gratifying involvement in productive or creative work; maximum behavior development
a. Those who have normal emotional responses, with some extremes in temperament occurring (e.g., acute sensitivity) or other affective and noncognitive strengths (e.g., leadership)	*Conceptual development* in factual knowledge	Factual information and realms of knowledge derived from formal structure of content subject matters	Personal exploration according to interest and need; instruction to facilitate individual learning ability	Understandings and technical skills in the degree required for satisfying experience with motivation to continue lifetime learning
b. Those who are superior in some intellectual potential, with differentiated patterns of cognitive strengths	*Perceptual development* built upon existing internal strengths	Any activity involving complex mental processes subject to structural or functional modification in daily stimulation or modeling – identification	Opportunities for exercise of individual intellectual potentiality built upon innate neural strengths	Optimal development of original potentiality for higher intellectual skills, such as reflective, critical, creative thinking
c. Those who show high superiority in talent or skills – physical and aesthetic	*Aptitude development*	Relevant technical knowledge or activity (complex and subtle); systematic knowledge of the particular discipline, like music, art, athletics	Sustained, exacting experience at the most sophisticated level of development in theory and technology	The evolvement of localized and extraordinary comprehension and skill

*Adapted for this publication with permission of the author, Virgil S. Ward, University of Virginia, copyright 1968.

Column 1 lays a foundation for the identification of relevant differentiation of characteristically similar gifted children. Columns 2, 3, and 4 lay the foundation for the curriculum and its objectives as well contribute to a framework for evaluations.

Typical Principles in the Special Education of the Gifted

Many principles of education for *all* children contain suggestions for the gifted. The authors of this document, however, have developed its contents with the differential needs of the gifted in mind. Principles for special education of the gifted must be derived partly from (1) the characteristics of gifted children; (2) the technical and social conditions of the times; (3) psychological findings about learning and intelligence; (4) classifications of knowledge; and (5) studies of the conditions of learning.

A number of books, monographs, and articles listed in the "Selected References" here discuss principles, objectives, and goals in the special education of the gifted. Nevertheless, the following selection of principles, although by no means an all-inclusive listing, has been derived specifically for the purposes of this present work.

Principles for Personal Development

Special education of gifted young individuals is intended to do the following:

1. Aims to develop potential to the highest degree compatible with the uniqueness of the person and the role he will play in his society.
2. Develops and enriches the gifted child's natural learnings toward responsibility, social conscience, and sensitivity to ethics and to values.
3. Prepares the child for leadership in the area of his special competency and in the area of general affairs, if he chooses both.
4. Encourages inner awareness of rationality, judgment, thoughtfulness, and sensitivity to people, to problems, and to the environment.
5. Enlarges aesthetic and empathic understandings, appreciations, and responsiveness.

Principles for Developing Skills

Special education of gifted young individuals is intended to do the following:

1. Prepares the child in those basic skills, understandings, and attitudes which underlie advanced learning and adult efficiency.
2. Must provide recognition of, and opportunities for, the development of those special higher-order abilities and learnings which are possible for the gifted but highly improbable for others.
3. Helps the child to understand his own learning pattern, teaches him to secure feedback from the environment, and helps him to evaluate his own accomplishments.
4. Prepares the child for vocational and economic sufficiency and often lays the groundwork for career specialization.
5. Must be supportive of the development of creativity as this trait arises either from intuitive or from critical processes.

Differential Behavioral Objectives for Curriculum: Viewpoints

What, then, are the curricular objectives that stem from the principles underlying special education of the gifted? The objectives listed in this section have been derived from the principles and commonalities contained in the four broad theories discussed in this chapter.

Obviously, there are many ways of stating objectives. One way – that of delineating *behavioral objectives* – states them in terms of measurable or observable learner behavior to satisfy three principal criteria: (1) to indicate precisely what the learner is to do; (2) to specify the level of performance that is satisfactory; and (3) to state the conditions under which performance is to be tested. The writers of this chapter, however, have developed less stringent definitions. The objectives listed here are not intended either to be exclusive or to be all-inclusive; they do not follow a hierarchical order nor do they necessarily fit into a developmental pattern for any one subject area. Rather, these listings represent a way of stating educational objectives that aim at maximizing the development of certain characteristics of mentally gifted minors. The lists can be used as a working basis for developing the fuller potential of the gifted and can also be used as a foundation for ongoing evaluations.

The differential behavioral objectives with which this section is concerned are divided into two major divisions: those for students and those for teachers. The part concerning teacher objectives is further divided into situational, personal, and process goals.

Student Behavioral Objectives for Special Education of the Gifted

The following list identifies behavioral objectives for special education, in terms of the gifted student. The student does or manifests the following:

1. He learns independently and develops useful organizational schemata and structures.
2. He learns progressively which strategies and styles are most effective for his progress.
3. He processes and incorporates subject matter and the curriculum into his own learning strategy.
4. He selects and employs resources for research and exploration more carefully and to a greater extent than does the average student.
5. He uses these resources more frequently and more independently than does the average learner.
6. He communicates abstract and complex ideas effectively.
7. He learns to frame questions with the clarity and specificity necessary to obtain the information he needs.
8. He learns to inquire critically, systematically, and effectively into situations that he regards as discrepant.
9. He shares his information in group endeavors.
10. He generalizes accurately from what he has already learned and applies generalizations effectively to new, unusual situations.
11. He takes discrete or abstract ideas and synthesizes them into patterns meaningful to him.
12. He analyzes complex theories, ideas, and concepts according to their component parts or underlying assumptions.
13. He judges relationships, conclusions, and evaluations.
14. He establishes relevant criteria for the evaluation of theories and ideas and applies these criteria with clarity.
15. He evaluates his strengths and his weaknesses realistically and comfortably.
16. He elaborates, through various media and modalities, his concepts and understandings.
17. He expresses intellectual curiosity and seeks ways to satisfy it.
18. He can "fail safely" and thus profit his decision making by learning from past errors.

Teacher Behavioral Objectives for Special Education of the Gifted

The following list identifies behavioral objectives for special education, in terms of the teacher of gifted students. The teacher does or manifests the following:

A. *Situation Goals: objectives to be sought within the teaching situation*

1. He (the teacher) provides the climate and the opportunity for students to discuss, examine, and support a position or a stand without the intervention of his own personalized "teacher value judgments."
2. He introduces individuals who are able and willing to serve as models (both implicitly and explicitly) and who intellectually represent the gifted community. These models can be drawn from younger or older members of gifted peer groups, and from adults as well.
3. He consciously creates a learning environment that enhances the development of a positive self-concept.
4. He consciously promotes achievement commensurate with ability.
5. He takes an objective view of academic weakness wherever it exists and helps the learner to overcome it.
6. He encourages a complex but challenging environment where curiosity, imagination, exploration, and excitement can occur.
7. He shows awareness of (a) the extent to which he himself must be able to adapt flexibly to differentially gifted students and; (b) the extent to which he must adapt his organized schedule or plans.

B. *Personal Goals: objectives to be achieved in student-teacher relationships*

1. The teacher identifies and is empathetic with humanity and humanness because students whose skills are too heavily academic may intellectualize at the expense of developing their interpersonal skills.
2. The teacher and certain gifted individuals serve as models: the teacher, however, recognizes that as the students grow, they may change their models.

C. *Process Goals: objectives to be achieved in the process of teaching*

1. He (the teacher) organizes the program around unit topics, projects, interests, or study themes, because research shows that student interest and student level of intellectual operations are motivators.
2. He reduces the time ordinarily needed for the mastery of learning tasks (basic skills) by providing a variety of

materials relevant to those tasks and by demonstrating procedures that could serve as possible shortcuts.

3. Often and intentionally, he elicits and reinforces exploratory responses from gifted students.
4. He stresses concepts and relationships among elements that constitute a concept.
5. He takes many opportunities to teach evaluation skills.
6. He illustrates the interrelationships among concepts related to learning tasks and asks the students to generate additional illustrations.
7. He stimulates further reading, study, research, and formal and informal education and finds scheduled time to accommodate these efforts and inquiries.
8. He refrains from assigning any "busy work," and he does not call certain types of educational tasks "enrichment" when mastery of these tasks is obviously demonstrated.
9. He encourages the exploration of cross-disciplinary issues that contribute to the development of incidental and concomitant learning.
10. He uses problem-solving approaches frequently and acknowledges alternate ways of arriving at solutions.
11. He recognizes that gifted students require fewer stages to reach solutions to problems, and yet he also recognizes the value of reinforcement and does not yield to the temptation of ignoring this factor.
12. Providing fewer hints for solutions to problems, he allows time for incubation but also promptly offers suggestions when defeat sets in.
13. He encourages a wide range of interests to be expressed.
14. He recognizes that creatively gifted students are likely to persevere in meeting self-selected criteria of achievement, whereas the academically gifted often depend upon teacher criteria.
15. He invites and encourages expressions of creativity and originality.
16. He recognizes, accepts, and values the fact that gifted students manifest a broad range of innovative behaviors.
17. He constantly cultivates honest and direct communication.
18. He encourages a greater amount of student-directed learning.
19. He allows opportunities for the student to do reflective thinking, critical thinking, intuitive thinking, and innovative thinking.

20. He encourages the gifted student to interact freely with his peers and provides opportunities for each member of the class to develop skills in receiving and responding to the ideas of other students.
21. He understands the universality of human experience, and he can appreciate the feeling of uniqueness and sometimes the feeling of aloneness that gifted children experience.
22. He considers the value of, and finds time for, student feedbacks regarding learning experiences.
23. He is aware of the possibility that the gifted student might resist further refinement of a product once the student has arrived at his own standard of mastery.
24. He recognizes that the gifted student may have several interest-related activities proceeding concurrently and that the student may zealously guard his free time to pursue his varied projects.
25. He allows cessation of interest when it occurs.

Summary

This chapter has summarized the nature of giftedness and the way in which this endowment demands particular changes in curriculum to encourage mental health and meaningful productivity. Some major theories have been discussed and their commonalities used to derive principles upon which student and teacher objectives can be validly based.

CHAPTER III

Subject Areas for Gifted Students – Content, Concepts, and Learning Tasks

This chapter is essentially a study of curriculum content in the education of gifted minors. Eight subject-matter areas at the major educational levels in California public schools are considered. Each of the sections presented here (1) discusses some of the facts, generalizations, and principles which a particular discipline involves or should involve; and (2) suggests ways of developing creativity and other high-order intellectual skills.

The substance of Chapter III is closely parallel to, though not as detailed as, the series of curriculum materials that have been prepared for use in programs for the gifted by teachers and other educators in schools, school districts, colleges, and universities. These materials (formerly called "individual frameworks" and included under Part I of the ESEA, Title V, project) are intended to indicate broad bases and an overall philosophy regarding curriculum and instruction in each subject field, whereas the "curriculum guides" (under Part II of the project) offer practical approaches and specific lesson plans.

The text for this chapter was prepared by subject-matter specialists, including gifted students who had just finished their schooling, teachers who were completing their training, and professional experts who had acquired long experience in the teaching of particular disciplines.[1]

It is the aim of this chapter to focus attention on the subject-matter content of curricula for the gifted; on appropriate methods of presenting and teaching this content; on effective ways in which talented children and youth can learn, retain, and apply what is offered; and on certain factors having to do with the deeper, broader aspects of the educational experience. Selected concepts and

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[1]The names of personnel involved in the preparation of Chapter III, as well as those persons who contributed to the development of individual manuscripts under Part I of this project, are listed in the Acknowledgments for this preliminary publication.

techniques that have already been found helpful to both teacher and student are identified.

Although the overview contained here and the separate parent documents have been developed mainly to assist teachers of mentally gifted minors, these materials are also recommended for use by administrators, consultants, counselors, and other professional personnel who are interested or involved in helping talented young people at any precollege level of public school education.

The eight subject-matter divisions, each with subdivisions arranged according to grade level, follow. A section on kindergarten education for gifted children is also included.

Mathematics

Nearly every child likes mathematics – until someone turns him against it or even causes him to fear it. The scars of this negative influence are commonly seen among gifted high school and college students who avoid mathematics "like the plague." Thus, society loses the potential of such students for science, and – more to the point – these young people miss a world of excitement closed to them by unfortunate early experiences.

A mathematics program for the gifted pupil must not only avoid killing his natural interest; it must also provide learning experiences that nurture his interest, engage his abilities in meaningful ways, and supply his young imagination with new possibilities and challenges. Such experiences should open up the broad discipline of mathematics to him and should lead him readily to higher levels of process and complexity. If these objectives are realized, the gifted child will move safely past the fears and the mental blocks that are so often manifested by older students today.

For such a program, it is helpful to distinguish among the learners those who are both talented and interested, those who are talented but not interested, and those who are neither talented nor interested in mathematics.

Young persons not talented in mathematics should be protected from competition with talented peers, because imbalanced competition often yields permanently negative attitudes toward mathematics on the part of the former.

Three major premises underlie the mathematics program for gifted minors: (1) all gifted children can learn to enjoy mathematics; (2) children differ in their ability to think quantitatively; and (3) teachers differ in their own mathematical abilities and interests. Therefore, any program in this subject area should provide a variety of alternatives for both teachers and learners.

Mathematics, Grades One Through Three

A mathematics program for gifted children at the primary level should be influenced by four factors: First, there are differences among children with respect to their interest in, and ability to grasp, quantitative ideas. Second, children of this age need the tangible, the concrete, the real, and the relevant. Third, mathematics requires understanding of sequence and continuity. Fourth, the instructional program should relate to concurrent learning experiences in other subjects; these experiences must be integrated so that the gifted child's potential will be realized.

The teacher must be careful to maintain a dynamic relationship between his teaching and the pupil's exploration. The appropriate emphasis depends in large measure upon the quality of the pupil's giftedness. Unfortunately, we know relatively little about the effects of giftedness on learning in the primary grades; indeed, we know precious little about learning at this level – even that of the average learner. We do know, however, that the learning of concepts and skills in mathematics depends upon prior experience in related subjects. This connective dependency suggests that learning in a variety of fields is to be encouraged. Fortunately, the gifted commonly have interests that are many and broad. It remains for the teacher and his specialized mathematics program to enhance and to capitalize on this characteristic of diversity on the part of the gifted child.

The following are mathematical topics to which all primary pupils should be exposed: (1) numbers and operations; (2) geometry; (3) measurement; (4) applications; (5) statistics and probability; (6) sets; (7) functions and graphs; (8) logical thinking; and (9) problem solving. Exposure to these topics, nevertheless, and learning the concepts and skills which they entail are not enough. It is important that the program as a whole achieve depth, provide selective emphasis, and promote in children a desire for complexities beyond the requirements of the standard curriculum.

The gifted learner's program in mathematics should add greater emphasis to geometry, graphing, patterns, relations, logic, and problem solving; and, for those interested, the program should take in the quantitative aspects of science and social sciences, signed numbers, probability, recreational mathematics, and the cultural aspects of mathematics.

Gifted children – even those with identical IQ scores – are as unlike in regard to skills in quantitative thinking as they are in regard to other kinds of skills. Therefore, a responsive program is crucial.

The highly talented learner, when he prefers to do so, should be allowed to work independently and to cope with problems of increasing complexity. This arrangement can be provided for (1) by advanced placement for mathematics *only;* (2) by guided study, with access to advanced texts; and (3) by contact with a person who loves and understands mathematics.

The effective teacher will lead his pupils from the concrete to the abstract, from lower levels of understanding to the subtleties and logic of a higher degree of understanding, and from specific learnings to generalizations stated with precision. If these and other educational objectives are to be accomplished, each of the following intellectual operations must be respected and nurtured: (1) cognition and comprehension; (2) knowledge or memory; (3) divergent and convergent applications; (4) analysis; and (5) evaluation and synthesis.[2]

Indispensable to the program, moreover, is the creative aspect. Creativity in mathematics can be developed when the following conditions exist:

- There is a rich environment (for example, a well-ordered, stimulating mathematics laboratory).
- There is a flexible plan of instruction for the entire school year.
- The pupil is encouraged to interact freely with those of his peers who are involved in the mathematics program.

Mathematics, Grades Four Through Six

Few subjects can inspire and encourage individual discovery as that of mathematics. If the young child is allowed to enjoy and manipulate a rich mathematical environment, if he is guided into the abstract world of symbols in such a way that his experience is an adventure, if he is encouraged to explore many approaches to a problem, then he will come to find deep satisfaction in trying and testing his own mathematical ideas.

Mathematics is an invention. Man invented and continues to invent numbers and number ideas to understand the rhythm in his environment, to suit his growing needs, and to fulfill his soaring imagination. As a gifted child realizes these things, he perceives that mathematics is an abstract yet very useful system to which – if his interest is sustained – he may add some variations of his own.

A rich environment, such as a mathematics laboratory in a classroom, helps to create an instructional materials center where an

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[2]See Chapter II for a discussion of intellectual operations.

exciting variety of manipulative materials is available: games, puzzles, filmstrips, tapes, kits, books, and work sheets. It is essential, whether the center is elaborate or modest, that ongoing activities be arranged in such a way that pupils receive feedback from their participation. The center should offer many opportunities for random, casual exploration; but it will lose its attraction if that is all it offers. Many teachers find "job cards" a useful device for setting up independent learning activities.

Mathematics, Grades Seven Through Nine[3]

Many activities are fundamental to all mathematics learning. Among these are the following:

Play (informal exploratory behavior)
Manipulation of materials (space, weight, and volume conservation)
Abstraction (the identification of that which is common to a number of situations)
Generalization (the extension of an abstract class to a broader class)
Particularization (the passage from a broader class to one that is more restrictive)
Symbolization (the symbolic representation of mathematical ideas)
Interpretation (the determination of meanings underlying symbols)
Deduction (the logical derivation of new relationships)
Axiomatization (the determination of a small basic set of relationships from which all others may be derived)

Significant studies made in recent years have suggested that mathematics no longer be taught as a study of separate branches within this discipline but, rather, as a set of systems common to all the classical branches of mathematics. Within this rationale of interrelatedness, a spiral approach can be used effectively; for example, the following schema indicates the spiral development of a topic:

Real functions are studied.
These are expanded to polynomial, rational, and circular functions.
Polynomial functions and their graphs are reviewed, and informal differentiation is begun.

So that the young student can learn generalizations, concepts, and structures, the teacher needs to ensure that the method of learning is based on the application of a model of human learning. The student should be trained to apply mathematics appropriately in a given situation. The synthesis of his mathematical learning requires that he

[3]Elsewhere in the ESEA, Title V, project for the gifted, this grade level is occasionally designated as "grades seven and eight."

will have (1) searched for and recognized certain patterns; (2) assembled and analyzed data; (3) inquired into the nature of these data; and (4) made deductions, calculations, and interpretations. These activities call for judicious use of logical methods and mathematical structures previously studied.

This method of learning makes as much use of the imagination and guesswork as it does of verification and criticism. It develops, on the one hand, confidence in using the known; and on the other, ability to cope with the unknown. It calls for discovery of knowledge and then for the organization of knowledge into scientific categories. Less emphasis is placed on *how much* subject matter is covered; more attention is given to process and to the way in which content is covered.

Mathematics, Grades Ten Through Twelve[4]

Modern research in mathematics recommends that students be familiar with the following basic content areas by the end of the twelfth grade: systems of numbers, measurement, geometry, coordinate systems and graphs, algebraic sentences and their solutions, relations and functions, algebraic expressions, probability and statistics, and logic. Study of this subject matter should include specifics, of course; but teaching and learning the content should also include concern for facts, concepts, generalizations, understandings, and principles within the areas. In addition, each subject (or content area) demands a complex of skills that increase in power and generality as the subjects are addressed sequentially until high intellectual skills have been attained. Creative attitudes, creative behaviors, and the products of creativity may, in time, contribute integrative growth and development to the fulfillment of the student's potential.

A growing number of educators hold that mathematics should be de-emphasized as a body of knowledge to be transmitted and that, rather, mathematics should be reaffirmed as a way of thinking. The paragraphs that follow offer some key ideas and examples that may be found useful in teaching mathematics to gifted high school students.

Requirements for teaching generalizations and problem solving become particularly necessary in the upper years of schooling (grades seven through twelve), where curriculum design must be based upon cognitive and instructional styles as well as upon mathematical

[4]Elsewhere in the ESEA, Title V, project for the gifted, this grade level is occasionally designated as "grades nine through twelve."

content. Patterns of classroom grouping should use teaching strategies sensitive to the needs, achievements, and abilities of the gifted learner who chooses to continue in mathematics.

Mathematical reasoning requires unmasking, simplification, and reordering. Problem solving should call for the nonroutine application of concepts in a nonpracticed context. Associated stimulus patterns should promote the use of new formats, and content should focus upon patterns of organization rather than upon content per se. If higher intellectual skills are to be developed, a distinction must be made between cues that identify response-determining properties and cues that identify an appropriate combining operation.

Concrete referent materials help to minimize vocabulary problems, and exploration with physical objects allows the student to use his own senses to experience reality in a direct way. Then the teacher can bring in words during subsequent discussion, and the student will merely have to learn the name corresponding to the meaning; indeed, he learns the language by using it.

The degree of the student's understanding is linked with the amount of practice he has had with problems that demand (1) recall of relevant knowledge; (2) selection of an appropriate operation or operations; and (3) performance of the operation or operations. Because mathematics is a consistent discipline at all levels, each consequence which the student can derive for himself should provide some positive increment toward learning more mathematics. "Moments of triumph" in this process should not pass unnoticed; and lack of success at some given point should not be construed as "failure" but accepted as a part of learning.

Half-formed ideas should be used as stepping-stones to true statements or to more relevant statements, and time should be allowed for this development to take place. The teacher should provide "answer-seeking" instructions and withhold "answer-giving" ones in order to let the learner develop a strategy for discovering new principles. A rigid, inflexible teacher or schedule will deny such "moments" for the gifted student.

Mathematics must be studied in a meaningful and structured manner but should be adjusted to the student's rate of learning, to his mental ability for making abstractions that deal with complex ideas, and to his need for many concrete examples and applications of a given mathematical concept to be learned. It is also desirable to convey clearly to the gifted student the significant fact that every mathematical idea appeared first as some individual's solution to a particular problem.

For a fuller development of the gifted student's potential, it is important to realize that his giftedness is more than what is indicated by an IQ score. His unique abilities lie along one or several intellectual dimensions: memory, cognition, evaluation, convergent production, and divergent production. Creativity on the part of the teacher will allow for (1) the development of one or more of those dimensions; (2) the formation of constructive attitudes and behaviors; (3) the strengthening and heightening of skills; and (4) the attainment of valid results. Accordingly, mathematics should be presented as the pursuit of truth by a process of inquiry, and this process should elicit all the insight and creativity of which the student is capable.

Finally, looking again toward the curriculum, one can see that probability with statistical inference, calculus, and elementary numerical analysis provide a fitting and satisfying climax for the last years of secondary schooling.[5] Not only do these topics provide for the needs of young persons who will use mathematics; but also, most significantly, they provide for a complete general or liberal arts mathematical education, which the secondary school must provide regularly in the future.

Science

This discussion of content is closely connected with the separate science curriculum materials that have been prepared under Part I of the ESEA, Title V, project for the gifted. Those materials offer suggestions for conducting an interlocking, sequential program for gifted learners in the subject field of science. The program, which comprehensively covers 12 years of public schooling (grades one through twelve), is summarized here under a single heading.

Approaches and Emphases

It should be noted, first of all, that the approaches for this curriculum are not coercive; the teacher, therefore, is free to develop teaching-learning environments that fit the particular circumstances at hand.

Secondly, the program plan for the gifted gradually shifts emphasis toward independent study. The interdependence so prominent in the primary years begins to wane in the intermediate years, falls off noticeably in the junior high school years, and finally yields to a strong sense of independence in the senior high school years.

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[5] As used here, "secondary schooling" means high school education. The term is not meant to include the junior college level.

This change in emphasis is most desirable in the science preparation of mentally gifted minors.

The 12-Year Program

To explore, to inquire, to search out, to test, to seek concepts – these are what children and youth should do as they study and work in science. Using the same conceptual themes proposed by the *Science Framework for California Public Schools* (1970), this program stresses basic concepts, fundamental principles, and key modes of inquiry. Beyond these things, the plan calls for more and more independent activity and a sharpening of higher-level intellectual processes.

In principle, the science curriculum should have three characteristics:

- The curriculum is not to be set apart from the instructional mode; that is, concepts are synonymous with their operations.
- Depending on the administrative style of the school, the curriculum should permit enrichment (movement in depth) or acceleration (movement along the vertical thread of conceptual development). The former retains the graded structure; the latter, using the nongraded approach, sustains continuous progress or continuous experiences.
- A curriculum that offers acceleration and enrichment is not sufficient. The curriculum must encourage and develop opportunity for independent work.

In the primary years those boys and girls who are or will be the gifted learners in science can only be tentatively identified and selected. Identifying such children is best accomplished by observing their curiosity and "need-to-know" interest in science, as well as their continued activity over a span of years.

In the intermediate years the teacher should plan programs that progressively stress personal and independent work, where the teacher acts as a guide and a "catalyst" to the learning situation.

The "independence training" of children can be effected in one of at least two curricular progressions:

1. *Nongraded progression (continued program).* Each student progresses as surely and as rapidly as he is able. At each stage, interviews and demonstrations of his activity show his growth in concept seeking.
2. *Enrichment within the grade.* Gifted children are given opportunities to proceed in depth with any module of activity of a "Learning Activity Package" (LAP), which is based on a

concept. They do not proceed to the next level but probe more deeply into concept seeking at the same level.

As a curricular module, a LAP is, in effect, at the heart of any program for the gifted – probably for all children but certainly for the gifted. A curricular schema or grid, applicable to a particular grade level (e.g., the primary grades), can be developed as a guide to context. The grid can be divided into possible LAPs that fit each concept statement. Each LAP should be broken down into smaller packages or mini-LAPs. Once concept statements have been broken down, then the GIA (General Instructional Activity) or GIAs (several of such activities) can be developed for particular kinds of learners.

In practice, once a model based on cognitive themes is developed and the operations that support the concepts are chosen, the processes fall easily into a plan in this manner: (1) a concept statement is selected from the model; and (2) operations that are synonymous with it are developed. For example, the concept statement, "In any environment there are characteristic conditions for life," may generate the following:

Activities, Experiences, Investigations	*Methods of Intelligence*
Interdependent Activity	**Inquiry Processes Stressed**
1. *Study trips.* To the immediate environment: Characteristic living things are identified (children isolate the identifying characteristics and invent names for the organisms). In good time the common names, or scientific names, are developed by the children through reading or through consulting with an "expert."	Observation Categorizing Inference Invention Library research (reading of source names of specimens, use of pictures to help in identification, and the like)
2. *Simulation of environments.* Children develop terraria and aquaria simulating the following environments: Aquatic (for tropical fish, or fish available in ponds) Aquatic marine (if possible) Wood, ferns, mosses, and small flowering plants (for frogs or salamanders) Desert sand and cacti (for lizards or desert toads) [Communities or individuals maintain the aquaria or terraria.]	Recording Observation Inference Invention (simulation) Library research Collecting and categorizing Analysis and synthesis (in inference) Hypothesizing (what would happen if organisms were placed in "other" environments?) Theorizing
3. *Analysis of a variety of environments.* Not only study trips but also films, filmstrips, pictures,	

and books are utilized. These are considered as sources of data.

As a result of activities in *1*, *2*, and *3*, children develop initial categorizations of environments and find reasonably good clues to adaptations of animals and plants. These are basic to the independent activity that follows.

Independent Activity

1. *Children select an animal or plant to investigate.*

   The animals:
   - Paramecium (a protozoan)
   - Daphnia (a crustacean)
   - Tenebrio (meal worm)
   - Cricket (an insect)
   - Elodea (a water plant)
   - Oats, or wheat, or corn (land plants)

   The first requisite is to maintain a supply of these animals. In so doing, children gain additional experience with the requirements of conditions for maintaining life: food supply, water, air, light, temperature, and so forth.

   (Ways of maintaining these animals and the materials to be used can be found in appropriate source books, which should be made readily available to the learners.)

2. *Each child is to design his own experiment.*

   It is known that most children rarely conduct a single experiment in their school careers; all their so-called "experiments" have foreseeable conclusions. For the gifted child in science, the experimental probe is basic.

Design of Experiments

Expecially the design of the control experiment

(The children gain experience in isolating and clarifying problems and even learn to defeat their own hypotheses.)

Recording of conditions and results

Even on the first-grade level, gifted children are quite ingenious in suggesting valid investigations, including those that involve "true" experiments. Often such suggestions result in independent study.

With respect to interdependent and independent work, it is obvious that certain behaviors are given free play. Behavioral or operational objectives, like processes, are part and parcel of the program emanating from the concepts and processes which the activities foster. Behavioral objectives cannot be considered apart from concepts or operations.

Two curricular modules for the gifted are the *course module* and the *consortium module.* For the primary and intermediate years, the structure of the curriculum might serve either nongraded or graded instruction. The modules for junior high schools are structured along conceptual lines. Two choices are available for the junior high school years – a longitudinal continuum of concepts through the seventh, eighth, and ninth levels or a horizontal development in grades seven, eight, and nine.

A curricular module includes a plan for (1) concepts and subconcepts, principles, and generalizations; and (2) the teaching operations, which serve to develop the investigations and data that support concept seeking.

Present science curricula in high schools are usually based on course modules, such as those pertaining to biology, physics, and chemistry. Another approach is used in the "special school" or the "special honor school" within a school. Here students with high ability are offered rich experiences in which, for example, the BSCS, CHEMS, and PSSC programs are used; or they are offered opportunities to conduct complex science projects independently; or they are allowed to participate in nearby industry. A third method involves a track system, which uses different approaches for differently oriented students. A fourth model is based on types of "learning activity packages."

Whatever the model or method, the necessary ingredient of all the programs is the opportunity for students to undertake work that is based on a conceptual rather than on a topical orientation. Development in the art of investigation (inquiry) is undertaken at the same time, and it is student-centered.

The sequence in the *course module for the gifted* might be altered in sequence, as follows:

Course Sequence for Gifted Students		*Course Sequence for Other Students*
Biology, based on physics – with concomitant mathematics	**Twelfth year**	Physics
Chemistry, based on physics – with concomitant mathematics	**Eleventh year**	Chemistry
Physics (highly mathematical treatment)	**Tenth year**	Biology

Course Sequence for Gifted Students (cont'd.)	*Course Sequence for Other Students (cont'd.)*
(PSSC physics might be given concomitantly with the mathematics required. Preparatory mathematical work might begin in the seventh grade. Students gifted in science can do the necessary calculus in the tenth grade.)	(Students in this track often do not take a sequence in science; the majority do not take chemistry and physics.)

In essence, then, gifted students in science (who are usually gifted in mathematics as well) might take a sequence of physics, chemistry, and biology; whereas gifted students not interested in science might take the usual sequence – biology, chemistry, and physics. A major loss to science occurs yearly when gifted girls and boys reject science because of the mathematics requirements.

Another curricular module available is the *consortium,* which has these basic elements:

- A consortium of individuals from college or university, community, and school who plan curriculum for the gifted
- The curriculum that is planned for a particular cadre of gifted
- A series of learning activities ("learning activity packages") and a body of research activities from which research problems are derived

The consortium module (1) makes optimum use of resources of the community; and (2) is quite facile with regard to planning for the idiosyncratic nature of gifted children and youth.

Whatever the curricular approach, it is important to bear in mind that for gifted children a curriculum of concept-seeking patterns serves as a taxonomy of cognitive tools – not only in science but in all the subject disciplines. Such a curriculum is conducive to more effective teaching and learning and provides the basis for warmer and readier communication between teacher and gifted learner.

English Usage

There is no denying the fact that spoken and written communication is a social endeavor that has a very high priority. Indeed, it is essential to man's well-being and even to his survival. That the art of communication is complex and often difficult finds abundant proof in the contemporary and historical failure of human beings to communicate clearly and meaningfully with one another. The finest endowments of individuals, communities, and nations can go for naught if people cannot make themselves understood.

One of the primary goals of the English program, then, is to help children and youth to understand, appreciate, and utilize their language with skill, discrimination, power, and compassion. When good usage of the language is accomplished, young speakers and writers are more likely to create freely, to develop self-confidence, to understand other individuals, and to take long strides toward the realization of their own potential.

With mentally gifted minors, the fruits of these enterprises in the use of English promise to have far-reaching effects. Equipped with strong, supple capabilities in both oral and written expression, their special talents can help the human condition more quickly and effectively than if their training in communications during their school years had been scant or haphazard. An inflexible regimen is never the answer; but that amount of consistent preparation which is geared to each boy or girl's individual potential yields insight and strength. Reflecting Aristotle's view, Ovid observed: "You will go most safely in the middle."

English Usage, Grades One Through Three

A program for gifted children should be planned around their unique abilities. Talented young people usually learn facts quickly and therefore need little repetition; they have superior reasoning ability and therefore perceive relationships and grasp ideas more readily than do learners of average ability; they are generally more creative and must be given ample freedom for creative explorations.

Language, man's greatest invention, is a system of symbols by which one individual can share experiences, ideas, and feelings with another. Because a child's singular experience is communicated first by sound, an English program in grades one through three should ensure that the skills of vocal and auditory communication are transmitted to the visual dimension.

A program for the gifted child should enable him to understand the following:

1. Categorizing and generalizing are means of ordering relationships.
2. Figurative language is a basic way of extending meaning and explaining relationships.
3. Meaning derived through language is unique and is representative of each individual's singular experience.

Many factors influence language growth. Among these are the child's home and school environment, home values, background experience, capacity to learn, general health status, and intellectual

abilities, not to mention methods of teaching. These factors must be assessed by the teacher and the psychologist so that an individualized program can be designed. At the same time, the child needs to experience activities that encourage independent thinking, planning, and problem solving: (1) associating and interrelating concepts; (2) evaluating facts and arguments critically; (3) creating new ideas and originating new lines of thought; (4) reasoning through complex problems; (5) understanding other situations, other times, and other people, as well as being less bound by one's particular environmental surroundings.

Academic experiences should be calculated to stimulate learners to leap the barrier from learning to thinking, as opposed to objectives that produce only convergent production and knowledge. That is, tasks which produce cognition, memory, and convergent thinking (facts and the storage of facts, spelling, phonics, sight reading, vocabulary, word skills, the application of correct solutions) are often too limited. The pupils should have at least equal time for divergent and evaluative thinking (creative solutions, critical thinking skills, and decision making).

Creative products in this subject-matter area are less easily accomplished in grades one through three if they depend upon a working command of communication tools. Yet these are the years when many or most children are quite open-minded and well motivated. In a society that places a high degree of approval on conformity, it is not an easy task to help each child recognize and accept himself so that he may dare to become a unique individual.

English Usage, Grades Four Through Six

In education it is necessary to define "curriculum" exactly. Often taken for granted, the word is subject to whims of definition, wandering directions, and foggy outcomes. It is sometimes found in a list of subjects; at other times, in a set of learning activities that fail to provide any evidence that learning has occurred when indeed it has.

A curriculum in English usage and related subjects (1) should develop demonstrable learning procedures; and (2) should examine the factual learnings, conceptual learnings, generalizations, understandings, and principles for the effective use of the English language. Plans for such a curriculum should guide the teacher in relating these elements to subject content and to higher intellectual skills in such a way that creativity may be released and human potential more fully realized.

J. P. Guilford (1960, 1967) has established the following criteria for identifying the creative gifted individual:

1. Sensitivity to problems
2. Fluency of ideas
3. Flexibility
4. Originality
5. Redefinition and the ability to rearrange
6. Analysis or the ability to abstract
7. Synthesis and closure
8. Coherence of organization

The teacher can assess whether his pupils show creative potential by means of the following:

- Verbal expressions that make rare connections between words. The teacher should immediately identify the connections, recognize them openly, and draw the pupil out as to how he perceives them.
- Demonstrations of new uses of knowledge or anything that suggests new uses. The teacher should give the pupil credit even if his behavior only suggests a new application.
- Signs of making a novel approach to any problem. The teacher should look for the ways in which a pupil views a situation and should encourage any manifestations of a promising perspective.

English Usage, Grades Seven Through Nine

How can the ideas of one man be communicated to other men? This traditional instructional objective remains valid for English classes today. But unlike yesterday's classrooms, in which emphasis was placed primarily upon reading and writing, the classroom of today needs to focus upon all forms of communication.

The study of English can be expanded advantageously to the study of all forms of communication. Since words are media of cognitive exchange, even in such communication media as television and films, the role of English for sharing information and building attitudes might well be examined in all its forms.

Electronic media communication skills, currently almost the exclusive province of advertising specialists and entertainers, should become an arena which students examine with care and interest. A study of communication calls for fully equipped communication laboratories in which students can examine all forms of verbal and nonverbal communication.

In such a setting, students will be asked (1) to determine what message they receive from a given film, television, or radio program;

and (2) to invent techniques for projecting similar messages. How music, sound, light, and color affect one's reception of an idea will be studied, along with the role of speech. Students will compare the central message presented in a book with the same or a closely similar message conveyed through visual and aural methods. From a variety of media possibilities the learners will choose those which are most appropriate for transmitting their ideas.

In the communication laboratory provided in this setting, the student will "do" communication rather than read about it. He will become increasingly aware of the response obtained by various forms of communication media. He will learn to recognize propaganda and to become more resistant to domination and exploitation. Textbooks should give way to primary source materials whenever it is preferable to use the latter. The total environment will become a kind of "master textbook," and the entire society will be recognized as educational.

The "new" English curriculum for gifted learners – in the setting discussed here – will be as much a change in teaching style as a change in content. The teacher will exchange his role as an authority for a role wherein he is more consultant than director, wherein he asks questions rather than writes on the chalkboard, and wherein he provokes thinking and instills excitement rather than lectures and tests.

Students studying communication will learn to recognize the variety of responses possible from receivers when a message is sent by means of different media. While words are the symbols most often chosen to convey thought, the problem of semantics may influence students to break the language barrier by using nonverbal symbols. The value of meaningful sight and sound symbols cannot be overemphasized. As students develop their understanding of how messages may be sent visually and aurally, they will become increasingly more discriminating as to their own reception of such messages and to the underlying meaning of such messages. In this way some aspects of critical thinking are developed.

A communication laboratory can provide not only for the boy or girl gifted in handling abstract verbal symbols but for the gifted nonverbal student as well.

Teachers who were educated in a book-and-word-oriented world need to retool if they are to be truly effective in reaching students who live in the media-oriented world of the present. The traditional classroom in which ordered information is structured into fragmented or classified patterns, into separate subjects, and into precise

schedules is no longer appropriate to the needs of most students and even less to the needs of the gifted. Not only must the subject matter be relevant, but also the way of life in the school system must be world-related.

While the equipment and supplies necessary for an optimum communication laboratory are prohibitively expensive, any teacher can establish some type of communication laboratory with few resources beyond those that are generally available.

English Usage, Grades Ten Through Twelve

Subject content for English usage at the senior high school level is discussed under the heading, "Literature and Language, Grades Ten Through Twelve," in the literature section that follows.

Literature

For all readers, literature offers an economical way to learn of the achievements, failures, and aspirations of a race. For the gifted, literature can serve as a high-speed vehicle to realms far beyond the ones he has known. Throughout history, whenever growth of the gifted has received intelligent aid, the consequences for mankind have been startling. Teachers of the gifted, then, accept immense responsibility when they agree to guide their charges along the kindred roads of the world's great literature and the functions of language.

Giftedness is something more than heightened normalcy; and introducing the gifted child to the content and use of literature requires more than intensified traditional English or "in-depth" enrichment. For the average, learning is expected to accumulate; for the gifted, it is expected to accelerate. The learning tasks and experiences of the gifted are apt to be richly complex, innovative, and highly individual.

Instructional programs for the gifted, therefore, must be exceptionally flexible and supportive; and teachers must be unusually accepting, knowledgeable, open-minded, imaginative, responsive, and secure enough to allow talented learners the freedom they need. The teacher of the gifted must be gifted as a catalyst.

Literature, Grades One Through Three

Literature is the heritage of man's ideas recorded in writing. In their early introduction to these ideas, young children, at the outset, need to enjoy and appreciate them. The gifted can be delighted first by the meaning, next by the way the author has chosen to express

this meaning, and third by the realization that literature can be used as a time-space machine to link the individual with other times, other countries, and other languages.

Selections for the literature program should be related to children's experiences and interests and should be made on the basis of ideas rather than vocabulary. Appropriate experiences in literature help young boys and girls to become aware of many dimensions of a particular concept.

Discussions of similarities and differences encourage pupils to crystallize their ideas; to perceive relationships; and to develop generalizations, transformations, and implications – all of which are the intellectual abilities that underlie critical thinking. Children have a natural tendency to complete sentences or join in a refrain or anticipate rhymes. The teacher can alert gifted young people to watch for rich language patterns; alliteration and onomatopoeia, for example, increase a child's sensitivity to word images.

The study of literature can and should encourage divergent thinking. Here, creative writing, as analyzed in discussion and in the comparison of styles, language, or structure, may teach evaluation skills. Children can end a story differently from the way the author ended it. They can also discuss what would have happened if a character in a story or poem had made a different choice. The possibilities of each choice can be brainstormed to evaluate the effects.

Literature, Grades Four Through Six

A study of the major kinds of literature provides gifted children with the opportunity to develop an awareness of the universality of human experience. This development can lead to an understanding of self and the ways in which man attempts to communicate his aspirations and values.

It is often desirable to engage children in studies of mythology, fables, folktales, biography, drama, and stories, as well as various elements of prose and poetry, so that they can learn about cultural values held by mankind in a cross section of countries. Thus each child secures a better understanding of universal ideas, of himself, and of different writing skills and techniques.

Literature offers many experiences in which boys and girls at this level can develop appreciation for language. Appreciation is built on many things: the excitement of the world of written ideas, information about the writer, knowledge of writing techniques, and a deeper understanding of the subtle meanings and connotations of words in the English language. Intellectual abilities are developed as

teachers help pupils to think independently, critically, and creatively while these young people assess, compare, and evaluate different forms of literature and the work of different authors.

A study of myths, folktales, and fables offers gifted children opportunities to study historical, cultural, and geographical similarities and differences among people. Descriptions of heroes found in literature help young learners to do some critical thinking as they analyze and compare human characteristics. Using a subjective-indirect approach to moral values, the study of fables, in particular, helps pupils begin to understand the motivation underlying certain forms of literature.

Gifted learners find that biographies are a broad, interesting source of information about people, their motives, their values, and their accomplishments. Most biographies written for children present models of good behavior and good character and are useful in helping children find self-identity.

Drama provides special opportunities for children to work in small groups and to use dialogue in developing characterization through verbal expression. Drama brings a new perspective to personalized communication.

In the wide field of prose, gifted young learners are made familiar with the elements of narrative form: setting, plot, character, time, and voice. In the challenging land of poetry, they become familiar with sound, meter, stanza, alliteration, and imagery.

Instruction in subject-area skills should include (1) reading – oral, recreational, skimming, and study; and (2) library skills – location and selection, writing, and listening.

Each kind of literature presented at this grade level may be developed as a unit of study, including skills that emphasize listening, reading, writing, and oral presentations.

Literature, Grades Seven Through Nine

For many students the years of early adolescence are pivotal for developing attitudes and beliefs as they begin to break away from the easy answers of childhood. They want to learn what it will be like when they become adults.

The English class period can be a time in the school day when young people discover that they are not alone with their problems. The study of the characters in books provides for the relatively impersonal examination and analysis of the human condition as seen through the eyes of an author and expressed through the words and actions of his characters. Students read about the difficult choices

made by others. In the safety of a book they can, vicariously, be somebody else. They can learn to predict consequences and begin to make value judgments. They can identify with a hero or suffer with a victim of wrong decisions.

The literature curriculum at this level may well focus upon a thematic approach that enables teachers to provide an arena for youth-adult communication. In this approach, one of the structures recommended identifies three main themes: heroism, temptation (the Faust figure), and situational ethics (Prometheus).

The comparison of legendary heroes of the past with modern heroes of books, television, and movies should encourage gifted students to search for reasons underlying the changing concept of heroes. Why, for instance, are so many heroes nonhuman in an age when science and realism are so highly valued? By contrasting literary heroes of the past with those of the present, boys and girls will make important discoveries concerning their own attitudes toward heroism.

A study of some of the stories with a Faust theme can help young people to examine their own problems of temptation without violating their personal privacy. Study of the Faust theme will provide skills in making objective evaluations and using strategies.

In learning about Prometheus' daring revolt against Zeus, gifted youth can identify some of their own aspirations and ambitions. Prometheus' act of stealing the sacred fire from Zeus may be interpreted by gifted students as a parallel to their own actions that are frequently interpreted as a revolt against the established system.

The major teaching suggestions for this content should stress application, analysis, synthesis, and evaluation activities. Moreover, gifted learners can use to good advantage an inquiry process or discovery approach as they study various units of literature.

Literature and Language, Grades Ten Through Twelve

The burden of intellectual inquiry must be carried independently by the gifted student, not by his teacher or textbook. The importance of the teacher's work with the gifted high school student lies not in what he can give to the learner but what the learner can accomplish on his own. Students at this level should be involved in processes of defining, question asking, data gathering, observing, classifying, generalizing, and verifying matters of language. Students are better prepared for college entrance or for assuming adult independence when they determine what lines of inquiry are worth pursuing and what arguments and conclusions are worth embracing.

The language that forms the basis for studies of English usage and literature is an open structure; its instability requires an eclectic and pragmatic approach. The eclectic view will allow for selecting doctrines from different systems of thought and will accommodate the numerous attitudes of the students in any given classroom situation. The pragmatic view allows for individualization of language tasks that are most effective for the student who may be gifted in symbolic and figural dimensions rather than semantic ones. Discussion of these systems of thought is found in Chapter II of this publication.

Any language has conventions that shift with time and space. Historical and cultural concepts are helpful in understanding the systems of conventions that allow the gifted to use language effectively. As the talented individual becomes fully aware of these conventions, he should be taught to employ the idiom that is suitable for his own expression.

The curriculum that broadens the scope and depth of the student's reading through selections offered, techniques revealed, and philosophies encountered utilizes four organizational approaches: history and chronology, genre, textual analysis, and theme. All of these approaches provide the gifted with insight and understanding. *The historical survey* permits the student to follow the development of a literary tradition and to study authors and their periods in their proper perspective. *A study of representative periods* helps students to understand that literature is not written in isolation. *A study of genre* provides a means for making explicit the differences and similarities among the various forms. *Textual analysis* offers rich opportunities to analyze and synthesize structure, style, and meaning by examining the internal relationships of a literary work. The study of literature organized around themes enables the student to discover the humanistic traditions that exist in our literary heritage.

A study of semantics and critical thinking will include inductive and deductive logic, propaganda devices, identification of the levels of diction and dialects, and the tools for improving and correcting composition. A study of the history of the students' mother tongue will include an investigation of the roots of the English language and the similarities that exist among all members of the Indo-European language family.

Intellectual skills developed in oral discussion can be transferred to a student's written work. Whether composition is taught as a separate course or is integrated with the literature program, students will write good papers when they are aware of the importance of

presenting accurate data in a well-reasoned manner. Specific suggestions should be made for developing the learner's ability to apply different skills in various kinds of assignments requiring cognitive-memory skills, convergent thinking skills, and the higher skills of divergent and evaluative thinking.

Social Sciences

The gifted young person can develop much of his potential as a participating member of society through the social sciences program. Before he ever comes to school, the typical American child has traveled to all corners of the world through the medium of television. He has accepted all of his world as being as natural as outer space. He has learned that the world is made of people who act and react, discuss and debate. But always his role has been that of a watcher. The social sciences program can offer him practice in becoming a participant in that world.

Few of the gifted blossom under the traditional lecture approach. The gifted child should take an active part in the study of man and society; he must learn about values, the importance of values, and the reaction of others to his own decision making; he must test his opinions, ideas, and skills among his peers and with older children and adults.

The chief purpose of the programs in this subject area should be to make the social sciences relevant to the gifted learner – relevant to his developing social skills through active participation and purposeful study.

Social Sciences, Grades One Through Three

It has been suggested that the key to educating gifted children lies in providing them with access to an array of persons, ideas, materials, experiences, and environments. The learner must become more than a convergent producer of correctness in mathematics and English; and the teacher must be aware that the learner has gifts other than academic superiority. Does the child have musical talent? mechanical aptitude? leadership ability? outstanding physical skills? abilities of an affective nature? Traditionally education has been concerned, for the most part, with enhancing academics; but educators must also show concern for *early identification of potential in these other abilities.*

The educational tasks in the social sciences curriculum at the primary level may well be designed to improve skills that have a commonality in theoretical descriptions made by Piaget, Guilford,

Phenix, Bloom, Krathwohl, and others.[6] Techniques for observing, classifying, interpreting, criticizing, imaging, and hypothesizing, along with practical applications for the classroom, should be utilized to best advantage. Ample allowance should be made in the program for problem solving among the learners, and teacher inventiveness in this regard should be encouraged. Details of problem-solving situations, for example, proceed from setting a goal, through appraising the situation, through the generation of ideas, to productive solutions and confirmation or rejection of the process.

Subject-matter content should emphasize generalizations and concept-breaking questions. While the spiral development of concepts and ideas is accepted, the teacher is expected to guide the quantity and quality of such a curriculum. Various levels of concept-breaking questions can be presented in a progression from memory, through translation, interpretation, application, analysis, synthesis, to evaluation and judgment.

Further curricular ideas can be proposed through discussion techniques: free discussion to encourage divergent thinking and semicontrolled discussions to develop organization and analysis. Suggestions should be offered for the encouragement of creativity; and the experience of being creative, rather than the teaching of creativity, should be stressed.

Social Sciences, Grades Four Through Six

The program at this level may offer a model for behavioral science inquiry in which gifted individuals examine questions relating to interpersonal relationships, intercultural relationships, and international relationships.

Under such a model in the social sciences, gifted children begin to perceive themselves as productive thinkers with responsibilities to themselves and to humanity.

Problems of the state, the nation, and the world are increasingly complex. If education for the gifted in this curriculum is to be useful, these pupils must be encouraged to engage in creative thinking, independent valuing, problem solving, effective planning, and decision making. It is equally important that they become aware of the significance of evaluating the validity of information in terms of its initial source and the ever-changing quality of factual information in the social sciences. In addition, gifted learners should be aware of the need for precise information in any particular learning situation. They should begin to examine the discrepancies

[6]See the Selected References for reference details and data.

between information coming from one source and comparable information coming from another. Experience in observing discrepancies in information can develop within the pupil a spirit of inquiry that can motivate future learning.

Social Sciences, Grades Seven Through Nine

The junior high school can provide a basis for enriching the social sciences program for gifted boys and girls by drawing from such disciplines as psychology, sociology, and anthropology.

The major goals in the social sciences include the development of human potential through process goals, personal goals, and situational goals. The student perceives the reasons for specific assignments, is able to communicate abstract ideas, analyzes complex theories and concepts, becomes aware of broad generalizations, uses specific data, and evaluates the reliability of sources.

In the area of personal development, the student learns independently, questions willingly, shares information, transmits ideas and generalizations into meaningful patterns, expresses intellectual curiosity, profits from constructive criticism, realistically evaluates his strengths and weaknesses, and cultivates honest and direct communication with the teacher.

Gifted students should be introduced to special research projects so that they will begin to follow informally scientific ways of studying.[7] As they progress to the next grade level, these young people can, through their research, develop more analytical intellectual skills. The class may be assigned the same project or different projects depending on class size, availability of research materials, and individual interests and time. Oral discussions will afford experience in oral expression as well as opportunity to develop mental alertness and quick thinking.

Before the skills of research techniques can be mastered, a study of logic is necessary. Steps in a unit on logic would include inductive and deductive reasoning, outlining, the research paper, selection of a hypothesis, class evaluation of a student's paper, and oral presentation. The gifted individual must learn to use the strategy of decision making: (1) identifying a problem; (2) collecting the evidence; and (3) making a relevant decision based on the evidence.

A value-centered approach stresses the application of classroom-acquired information to the real-life world. Concept-breaking questions not only polish communication skills; they also indicate the

[7] As it is used here, the term "scientific" means not only thoroughness and accuracy but also the use of systematic methods that approximate those of scientific inquiry.

importance of distinguishing fact from opinion and assist students in forming intrinsic values.

When teaching subject-area skills, one may find it worthwhile to begin a unit inductively and end it deductively. The reproduction of correct answers by the students (convergent production) is a lower-level intellectual task and is an ability to be used only as a foundation for evolving higher intellectual skills. If the approach is to become deductive, the students will have to do in-depth research.

The field-study approach can be used effectively for the development of creativity in the social sciences. Topics and issues to be explored in interview situations may be suggested or assigned to the students. The field-study method teaches the gifted young person, while he learns the art of inquiry, to communicate effectively, to understand other people's opinions, and to develop sensitivity to human problems.

Social Sciences, Grades Ten Through Twelve

The capacity to reason reflectively and constructively concerning the problems of man and his world should be the major goal of instruction for the gifted in the social sciences. The crux of instruction in the social sciences becomes one of identifying the kind of program that will enlarge, develop, and sharpen this capacity.

Four subgoals, in both the cognitive and the affective realms, are essential if the major goal is to be achieved: (1) depth and precision of understanding on the part of students in handling concepts and ideas rather than mere additions to a store of facts; (2) the ability to think abstractly, critically, and reflectively with social science data; (3) a set of values and attitudes of the kind that are concerned with one's approach to the study of one's field – concerned, that is, with the rules of the game, such as respect for facts, open-mindedness, and the like; and (4) participation in group action of a kind that reflects a desire on the part of the participant to seek, either as leader or as follower, the solutions to social problems.

In this program the need exists to formulate goals in behavioral or performance terms. Having postulated the goals, the teacher, together with the students, should plan and design a sequence of studies likely to achieve these goals. Whatever the design, it should be founded on the belief that a proper social sciences program consists of (1) modes and processes of inquiry; (2) concepts and generalizations from the social sciences that are the results of inquiry in these disciplines and that also serve as tools to facilitate further inquiry; and (3) particular time and place settings that provide the arenas in

which the processes of inquiry and the conceptual techniques are to function or are to be developed.

The sequence for the tenth grade might be grounded in the history of the United States, while that for grade eleven can be concentrated mainly on the history of the Western world outside the United States, with provision for in-depth study of one or two Eastern cultures, such as that of India or that of China. Grade twelve could emphasize a study of decision making in American society, as well as a study of some selected social science disciplines. The sequences should encourage and facilitate the integration of concepts previously encountered in other settings. Suggested settings should be substantially different from the typical approach in world history; the emphasis can be placed, for example, on national groupings, on the phenomena of conflict, and how conflicts have affected man. A well-thought-out plan will result in a course of study that has substance, manageability, meaningfulness, and much significance in understanding today's world. Work in historical integration should help considerably to dispel the "wearying qualities" of traditional programs – a weariness which both good and indifferent students have shared.

Foreign Languages

Each foreign language program for gifted children and youth, as it deals with a specific language at a particular grade level, should be concerned with the development of major concepts, skills, principles, and content objectives for the teaching of foreign languages to mentally gifted minors. Each program – and the various parts of each – calls for a flexible teaching attitude with which to enhance the gifted student's potential for learning languages. One problem that gifted students often encounter in the study of a foreign language is derived from too rigid a teaching-learning approach and too great an emphasis on rote. A not uncommon result is that the very students who badly need skills in communication spend the least possible amount of time in foreign language study and do only what is required for college entrance. While reinforcement is nearly always indispensable in the mastering of any subject or in the perfecting of any skill, the practice it entails should not be overdone, nor must it be allowed to impinge upon or push offstage certain other elements of the learning experience that are highly important.

Foreign Languages, Grades Four Through Six and Grades Seven Through Nine

The program for these two grade levels should develop the following: (1) ways to identify the child who is gifted in foreign

languages; (2) objectives of the programs; and (3) useful sources and curriculum materials.

Among the challenges faced by the foreign language teacher is how to identify the linguistically gifted. There is great value in identifying the student's ability early in his language career. Once the instructor becomes aware of the young learner's capacities and potential, he can capitalize upon them; he can handle his instruction differently from that used for other members of the class; and he can thus develop more rapidly the student's linguistic proficiency.

To assist the instructor in identifying the talented, simple tests that indicate the boy or girl's ability to distinguish sounds accurately can be used. General characteristics found in students who are linguistically gifted can be listed to facilitate identification. Some of these might well be the following:

1. Superior verbal facility, together with originality and creativity in written and verbal communication
2. Unusual sensitivity to people and to cultures other than one's own
3. High-energy level and above-average perseverance
4. Impatience with highly structured, repetitious routines
5. Inquisitive, explorative mind that is sparked by the exotic and the unusual
6. Intellectual styles that thrive on independent study and respond to unstructured educational experiences
7. Flexibility and ease in social situations, especially those that differ from accustomed patterns
8. Excellent memory
9. Interest in other languages and in foreign cultures

When a student enters the foreign language class for the first time, equipped with a sympathetic understanding of other peoples, the foreign language teacher has something upon which to build immediately.

Identifying the gifted is but the first step. The second concerns the teacher himself: his orientation to students rather than to subject matter; his leadership qualities; his potential for directing creative experiences; his academic preparation in the field of foreign languages; his superior command of the language at hand.

Certain pedagogically sound teaching resources need to be included in the program. With a view to the ultimate goal of improving all language teaching through the mastery of the four basic linguistic skills (understanding, speaking, reading, and writing), it is recommended that four "corners" be introduced into the classroom

as learning centers, where each skill would receive special emphasis. Accordingly, the model language classroom would have a *listening corner,* a *viewing corner,* a *reading corner,* and a *writing corner.*

The physical arrangements of each corner, along with the teaching resources connected with it, should be specified so that the teacher will be helped to select the appropriate learning activities. For example, in the listening corner the gifted student should find tapes and records that have been chosen to enable him to obtain insights into the kind of people whose language he is studying, as well as their country, their home life, their occupations, their favorite pastimes.

The viewing corner should become an active "doing corner" where the gifted learner shares what he has viewed. Differential materials and activities should be prescribed for memory development, evaluation, and convergent and divergent tasks for each grade level. By means of oral reports, original skits, prepared dialogues, puppet shows, and dramatized versions of well-known stories, the gifted young person can share with his classmates the interests and information he will have acquired during the hours spent independently in this special corner.

The reading corner needs to have a physical atmosphere conducive to reading: comfortable chairs, an alcove with partitions to shut out the distracting sounds of the classroom, and bright-jacketed books to evoke a response in the receptive reader as he visits here. Book titles often reflect the teacher's awareness of the student's age, sex, and interests. Many facets of human life and the environment around us – man's accomplishments, the world of fact, and the world of fantasy – can be found within the pages of foreign language books, and the classroom supply should be plentiful. Hopefully, the gifted student's response will mark the beginning of many pleasurable hours spent in the confines of this corner.

The last learning center, the "writer's corner," should be so equipped that a variety of artifacts, pictures, and other interesting objects can be seen and enjoyed. For the most part, however, the talented learner will have brought his own inspirations with him and will come here for the tranquility that is conducive to learning to write.

To assist the foreign language teacher to be creative, teaching aids should include books, games, songs, skits, and cultural realia.

Foreign Languages, Grades Ten Through Twelve

Many educators believe that a language, as it reflects the culture of a people, is most important to an understanding of the great

literature of that people. It would follow, then, that studying foreign languages helps us to understand and appreciate the literature of civilizations other than our own. When a student speaks a new language, he literally becomes another person.

This frame of reference for teaching languages cannot be overemphasized, for it offers a stimulating introduction to the importance of learning a second or a third language. Moreover, it is easier to understand and appreciate one's own culture when one comprehends other cultures that have been in existence longer than ours, and by understanding contemporary cultures, the student heightens his awareness of interpersonal and interracial relationships.

Whatever the language that is learned, facility in it develops kinship with the family of man and helps to eradicate barriers between peoples. One major goal for the gifted is that they know the value of communication through the exercise of that language.

Many gifted young people feel a need for grammatical analysis and use and are not satisfied with the imitative repetition of conventional phrases. This symptom should serve as a good signal for teachers who are interested in teaching a foreign language to talented minors.

Presentation includes more than methodology. Indeed, presentation is the kernel of the language-teaching process. A gifted learner will quickly grasp new material and retain it for a long time when it is presented to him correctly. Teaching the practical use of a foreign language is quite different from teaching facts and concepts of language and teaching the understanding and appreciation of the literature and the cultural patterns of a language.

Well-designed charts and tables can be used to advantage in this program, particularly to present syntax concepts of several languages for comparative purposes. A gifted student learns early that the word order in a foreign language is different from that in his own language. The more meaningful and personal the material, the more likely it is to be learned and retained.

Since the language student has to learn idiomatic expressions that are peculiar to the new tongue, any set of guidelines that are drawn up for language instruction should indicate ways in which the idioms of several languages can be presented effectively to the learners.

The tendency of the language student to carry over sound patterns of his own speech causes him difficulties in learning. Teaching important sound features of a second language gives proper balance to intonational patterns. Books, records, and other sources are suggested to accomplish this task. Special ways of overcoming

self-consciousness on the part of some students are recommended; for example, extensive choral work.

Another important part of the program involves the individualizing of lessons for the gifted. Characteristics of memory not only change with age but differ between types; for example, short-term memory ability is different from long-term storage. Helpful explanations and suggestions on the individualization of instruction should be made available to all language teachers.

A workable outline on the essentials for good communication would be of value to both teacher and student. A wide-ranging set of meaningful goals in the language program would be particularly useful to the teacher while working individually with his gifted charges.

Art

Like the spoken word, like literature, like mathematics, art is a language – probably the first, most universal, most personal one. For the individual it is an immediately available, direct means of recording his experiences, expressing and sharing his feelings, and projecting his hopes and ideals. From the perspective of our culture, art reveals the shared or, at least, accepted values of its members: clothing, architecture, billboards, sacred and political symbols, TV commercials. Such products of art are an important part of our surroundings, which, in turn, furnish the basis for the tastes and judgments that affect our quality of life and the image of the cities we hope to build. The quality of art education can help save us from being locked into a static, deteriorating environment.

As in other subject areas, some children and youth are gifted in one or more of the arts, and not necessarily at the expense of abilities in science or other disciplines. Quality teaching in the arts is particularly sensitive because of its personal dimension in the way it is linked to the young person's relatively fragile self-concept. Because of the competitiveness in this field, where performance is often judged according to popular criteria, and because of the confusion between ability in technique and ability in expression, many boys and girls with native talent and interest drop out.

On the other hand, art affords ample opportunity for imaginative, stimulative teaching, largely through imitation of its masters, through analysis of its content, and through a study of the personalities, the lives, and the times of the artists themselves. Moreover, art has usually been tied into other subjects. For example, graphic masterworks have been woven through the development and influence of science (e.g., the anatomical drawings in the books of Vesalius);

construction (e.g., the architectural and engineering designs of da Vinci); history (e.g., the historical paintings of Delacroix); journalism (e.g., the lithographs of Daumier); and so on. Works of this nature can offer appealing entries and pathways to gifted children with artistic leanings.

Although much of the subject matter is in the general context of art, specific suggestions and guidelines for teaching should be made available at each of the major grade levels.

Art, Grades One Through Three

Art forms abound. Man's "rage for order" focuses upon a sandy shoal; he makes a mark, then another and another; he has created visual form. Observing the clouds, he moves his arms, his legs, his head. He has created the ritual dance. Hearing the wind and the thunder, he waves a branch and beats on a log. He has created sound. He stamps his foot and makes a print; he chips a rock and makes a hole; he turns his head and sees infinite patterns and meanings that fill him with wonder. This is the threshold where art began.

The role of art in man's life is bound to the practice of art in such a way that the creative act is made relevant and meaningful. This general base, involving both objective and subjective areas in art, must be woven into the developing fabric of the individual child and must work with the natural growth of mental and physical processes to enrich and ennoble his life. Art is not static; it is a dynamic relationship between man and his environment. From the beginnings of mankind to the present, man has recorded his thoughts and feelings in his artistic creations.

As with the most recent scientific discoveries, the most recent products of art are the most difficult to evaluate. However, modern art speaks to us in the tempo of today, and often young people can appreciate it more readily than they can appreciate the art of the past.

In the primary grades it is an enormous responsibility to inspire creative behavior and, in so doing, perhaps to set the tone for a lifetime of each child. Educators must keep in mind that children at this educational level will one day become the future designers, craftsmen, and consumers of their generation and that their perception and judgment will affect the future of mankind functionally and aesthetically.

Art is a natural visual language for children six to nine years old; however, their direct and enthusiastic use of visual symbolism will contract into stilted stereotypes if the curriculum and the teacher do

not help them to organize appropriately their newly acquired information and skills.

The child at the primary level should not be restricted only to media or motor skills; he should be involved in the grand unfolding of human creative history through exploration, discovery, and the pride of making and doing. He must be taught to compare and analyze, but the interaction between the creative process and all other aspects of life must be emphasized. It is through relationships of the parts that the child is able to have a total experience in art.

The combination of sharpening vision, expanding cultural awareness, and growing artistic dexterity should parallel and support the child's burgeoning ideas and emotions that clamor for expression.

To avoid the criticism that is often made of apt third-grade pupils and the loss of art enthusiasts in the upper elementary grades, emphasis should be placed on the use of art techniques to a purpose. Seeing how others have accomplished that purpose enlarges the number of options the child has for individual solutions.

Another matter that calls for serious consideration involves kinship and continuity. To separate process from history, theory from practice, thought from feeling, design from fine art, will not further the concept of integrative enrichment which is proposed for the art program for mentally gifted minors.

Specific suggestions for carrying out the program at this level should be made available at the outset. Three aspects of art ought to be specified: the cultural role of art, elements of design, and the use of media and tools. In general, the art program aims to develop skills in three major areas: sensitivity or sensory awareness, manual or motor control, and intellectual or cognitive functioning.

Four basic ideas underlie the suggestions for art education in the primary grades: (1) the growth of the individual parallels the historical growth of the arts; (2) the development of *art learning* parallels the general learning process; (3) the class relates to the varicultured base from which art ensues; and (4) the skills, media, and cultural role of art are learned together, with the understanding that the feet, the road, and the signposts are all part of the journey.

Art, Grades Four Through Six

Never before has there been such a demand for artists and artisans, from television to package and product design. Comparative statistics are not available on the numbers of gifted and talented individuals who go into vocations supporting the media, but it is clear that the media constitute big business and employ many of the most creative among the populace.

Studio coursework should draw upon art history and the humanities to emphasize chronology, thematic content, and comparative cultural styles. It would be effective to make comparisons between the arts, music, dance, literature, and drama in the use of mood, rhythm, and compositional devices. Paintings of several artists can be compared to see how the same artist at different periods expressed the subject matter (e.g., the landscape, the figure). Whatever the subject focused on, the emphasis should be on recognition and analysis of relationships to material and process.

Clustering depends on the many variables in instruction and class participation. The choice may be dictated by any of the following in line with the child's interest and ability: current events (e.g., moon shot, rocket design); teacher's skill (e.g., photography or philosophy, the latter introducing great ideas through art); teacher's recent experience or access to enrichment materials (e.g., basketry of American Indians, Mexican handicrafts, a community landscaping project); a school project (e.g., development of a creative resource center); or any variety of pupil-initiated topics. The children's experiences can include collecting data, comparing and assembling similar structures, and evaluating the functions and aesthetic values of art objects.

Effective art programs for grades four, five, and six can benefit gifted boys and girls directly in areas of critical thinking, problem solving, memorizing, verbalizing, and sensitivity. Problem situations that build upon the children's abilities to assimilate given data and reconstruct outcomes in fresh, witty, and personal ways can be devised. This creative attitude is fundamental to art and has the potential for enhancing all areas of learning through expanding the individual's natural energies and perceptions and his ability to integrate learnings.

Art, Grades Seven Through Nine

Art is a subject that demands, as a prerequisite, the total person. It is an occupation which is at once endless and an end in itself. Man is *realized* in creating it. Art forms speak directly to the sensibilities of mind and heart. Through them the artist imposes order and meaning on the chaotic impressions he discovers and comes to anticipate.

The gifted student must be assured the opportunity to become acquainted with the ideas that concern artists. Rather than pursuing the elements of line, color, tone, and form separately, he should study the artist's efforts in arriving at the final product.

Direct, conscious, in-depth experience can come through working with media. Finding the possibilities, learning the dictates of

procedure, practicing with eye and hand to acquire skill may well occupy most of the time allotted in school programs. Emulation and experimentation can work together. The teacher's role is to ensure that each student, regardless of apparent ability, has been initiated into the realm of art and has recognized his own personal affinity that can be directed to some part of that realm. Some young people may have to push from inner worlds into the outer one, familiarizing themselves with the subject, urging their thinking forward, and furthering their original feelings. Here the teacher should be not only available but accessible, as well, for contact with the student's feelings at greater depth.

The spirit of art, if not evoked by an object, can be conjured up by other means: artists' letters and journals, histories and critical writings, novels and biographies. For the serious art student, semiprofessionalism begins early; it should include regular visits to museums and galleries as well as frequent reading of books and periodicals on art. Since these activities require expenditures of time, they offer unique ways of individualizing the curriculum to fit each student's needs.

The class philosophy must hold the premise that art and its properties go beyond personalities. This concept rests on man's heritage of thousands of years of artistic creativity. The art class for young adolescents should provide opportunity for each student's natural talents to manifest themselves.

It is important that gifted individuals find a balance between the direct pursuit of their own artistic fulfillment and the knowledge to be gained from the study of the methods and products of established artists.

Many teachers prefer the multisubject type of classroom, which is more likely to give them greater control and flexibility of timing and coordination of subject matter than the traditional classroom. There are advantages in being able to teach art for itself, as well as in being able to merge art into other subjects and activities.

Each classroom should have an extensive picture file, a wide range of media, and an audiovisual bank for tapes, slides, and records. When the regular classroom is used by an art teacher on alternating days, or when the art class is taught by a specialist who teaches on a rotational basis, the materials and the audiovisual bank could be placed on a portable cart, which in turn could be housed either in a student-center depository or in the individual classroom.

The sources of art are everywhere. Moreover, art travels in many directions and crosses many disciplines. There is almost no limit to

art-related activities in such content areas as drama; photography; music and dance, including opera and ballet; gymnastics and athletics; English usage; the study of literature; penmanship and printing; spelling and written expression; foreign languages; the social sciences, including history, geography, and anthropology; arithmetic and mathematics; and the sciences, including the natural, biological, and physical sciences.

Art, Grades Ten Through Twelve

The artistically gifted need art training in depth as well as in breadth. Creativity has only recently assumed a special emphasis in general education, and yet creativity has been a fundamental aim of art education for decades. Art activity of itself does not ensure creative activity on the part of the students. Guidance by a teacher who is a gifted and practicing artist will emphasize the creative rather than the conforming tradition of art.

Several important aims and enterprises need to be given close attention in the study and practice of art. These include observing and interpreting art and nature; gaining a mature knowledge of the arts, both past and present; developing self-understanding and strengthening one's self-image; and striving to maintain democratic conditions for people and ideas in art. The emphasis of a basic art course for gifted youth at the high school level should include skill development in a variety of media, self-development through an individualized approach to the analysis and practice of art, and a personally relatable knowledge of art and the humanities.

The individualization of work will help gifted learners to apply their interests and fulfill their potentials. In the scheduling of art classes, it must be remembered that creative assignments and projects are not likely to be completed satisfactorily within a prescribed amount of time, because individual differences are reflected to a greater extent in this educational area than in many other areas. Routes and destinations in the fine arts are not easily predictable.

In the creative process the exploratory search for answers, the incubation of ideas, the conscious rethinking, and the closure on a final solution are frequent steps which a well-directed art project will bring out.

Academically gifted students are noted for their high intellectual potential, but great variance in abilities and temperament exists among them. The uniqueness of the product of art, the artist himself, and the process of art make this subject especially adaptable and challenging to the higher intellectual skills of the gifted. With

reference to the art curriculum, some of the higher intellectual skills of mentally talented youth at the high school level are identified as follows:

> *Cognitive ability:* having keen perception and agile conceptualization, abstracting, grouping in units with attention to related parts, judging, recognizing likenesses and differences, thinking qualitatively and evaluating in depth
>
> *Problem-solving ability:* recognizing problems, reasoning, critical questioning, forming restatements, using new modes of observation, and showing proficiency in operations involving synthesis
>
> *Memory ability:* giving significant attention to classes, relationships, and implications
>
> *Language ability:* making symbolic transformations with comparative ease; manifesting fluency, better-than-average memory, sensitivity, cognitive ability, and ability to use symbols effectively
>
> *Sensitivity:* possessing more-than-usual sensitivity to sound and sight, a high degree of curiosity, and a positive affinity to the arts; understanding the use of symbols and configurations; showing sensitivity to the unified and the incomplete, to active and inactive systems
>
> *Productive ability:* manifesting drive and industriousness, showing capability in creating products on the basis of divergent and convergent thinking, and utilizing many of the abilities listed in the foregoing

In summary, objectives to be realized through the study of art include the following:

- To develop perceptiveness in the observation and interpretation of the visual aspects of art and nature
- To understand that while it has a life of its own, art is the purposeful product of an artist and is often the reflection of a society
- To relate the study of art in the history of man to the arts of today
- To find that art goes beyond the walls of the art museum and includes folk art, industrial art, film and television art, art that is derived from anthropology, popular art, and children's art
- To develop a critical outlook in reading about art and in contemplating art
- To arrive at tentative but well-conceived opinions about art
- To develop a personal working relationship between the study of art and the practice of it

- To be deeply receptive to art as a many-faceted language of meaning and vision
- To be sensitive to artistic intention
- To realize that one's own feelings and intentions are directly relatable to art
- To be aware of the purposes of society's domains of art in the past and in the present (fine art, commercial art, industrial design, amateur art, and so forth)
- To develop one's own personal tastes
- To be aware of humanistic principles
- To be able to relate to other cultures – to ideals and ideas within those cultures that differ from one's own
- To gain a mature knowledge and understanding of the heritage of the past and the forces of the present

Music

Evidence suggests that children in the primary grades are capable of sustained interest and motivation when they are actively involved in musical situations; but for many students in secondary schools, listening as the sole learning activity does not sustain interest. Gifted learners, then, need to be involved in playing, singing, creating, analyzing, and listening if their enjoyment of music is to become aesthetically important in their lives.

The purpose of all these activities is to encourage children and youth to develop musical concepts and the ability to generalize in musical terms. Thus, a "general music" class becomes a laboratory in musical learning, and a "performance" class or ensemble becomes more than just a means of developing one's skills or learning one's part in a particular piece of music. For the gifted student, performance experiences provide natural and direct opportunities for involvement with real musical content. These opportunities are too often overlooked by the teacher in favor of preparing another piece for another concert.

Music, Grades One Through Six

Evidence of correlation between intelligence and some aspects of musical talent has led many educators to contend that music education has a significant role to play in the full development of human potential. The gifted, most especially, need the challenges and opportunities that are afforded by extended exploration in as many specialized subject areas as possible. Consequently, music curricula for mentally talented minors should be concerned with three clearly defined groups of children who qualify for enriched music programs:

1. The intellectually gifted who also demonstrate talent in music and/or creative potential when given adequate opportunities
2. The intellectually gifted who indicate no special abilities or attitudes usually associated with musical talent or creative potential
3. The musically talented and/or potentially creative who may not score high on the Stanford-Binet Intelligence Test

While researchers continue to explore satisfactory ways of identifying talent, some of the most significant research and empirical findings relevant to the identification and development of individual potential have not yet been put into general practice. Much of this material is pertinent to the critical issues involved in planning and implementing aesthetically oriented programs for young people who are highly intelligent, creative, and/or musical.

The scope of curricular planning for a music program within this grade range should include (1) a classified list of critical issues; (2) relevant research and its implications for innovation; (3) teaching-learning suggestions; (4) sequencing and articulation; and (5) useful references and resources.

An effective way to challenge the higher intellectual capacities of bright children is to provide many kinds of well-guided opportunities for them to explore the nature and meaning of music as well as its wealth of literature. *They need to read.* With help they will transfer symbol-reading skills to the medium of music, where pitch and sound duration are also represented by and attached to visual symbols. As in the case of verbal "reading readiness," when there is a wealth of aural experience with music and some development of tonal memory and discrimination, hearing what is represented symbolically becomes a simple matter of association. Music may then come to be considered a curriculum companion to language arts, where skills, comprehension, and creative expression are already recognized as significant contributions to education.

Music programs for the gifted should contain the seed of innovation. Children should be encouraged to explore new dimensions of artistic expression; new instruments and tonal effects; new combinations of rhythm, music, art, words, dance, and drama; perhaps even new forms of music. New ways of learning should feature multimedia programming, with individual control of pacing, and should encourage self-directed projects that investigate the possibilities of such modern "music makers" as Moog Synthesizers and computers. Gifted young persons should be free to challenge traditional concepts, including the notation system, and to experi-

ment with new and divergent ways to produce, organize, and record sounds that express fresh and original ideas in keeping with the times in which they live.

The following are examples of significant questions that might well be asked concerning music education for gifted children in the elementary grades:

- What is the nature of the gifted child's approach to learning and how can the music curriculum best be organized to make constructive use of that approach?
- What are the criteria for nurturing musical talent and for challenging bright children in the study of music?
- How is the subject-matter content to be determined regarding (1) facts, concepts, generalizations, principles, and understandings; and (2) the scope and sequence of conceptual learnings related to the elements of music?
- What minimal requirements should be established for the selection, training, and scheduling of music teachers?

In order to understand the roles and the values of music education programs for the gifted, it is important first to consider the place of music in the American culture today and how this culture contributes to the specific needs of young children in a contemporary technological society. There are strong indications of need for music education in our technological society, because scientific technology may also have produced an "age of anxiety" – a transitional period that has created new dimensional problems within society and particularly within education.

Little research has been attempted to date to generalize from the study of music to an increase in academic achievement. However, inferences may be drawn from related studies that may have implications for unmotivated underachievers who have been identified as gifted.

> It is apparent from the analysis of hundreds of children's responses in the Stanford-Binet that when their intelligence is good but their school achievement falls below their expected ability, there is deficient auditory memory. [Meeker, 1969]

In experimental follow-up tests, many such children were asked to "order sounds." This task required them to arrange as many as six controlled sources of similar sounds in a hierarchy of loudest to softest to loudest. If at first they did not succeed in the tests and if there was no physiological loss of hearing, the children, in every case,

returned to the sound blocks to practice until they had learned to carry out this task.

The importance of auditory memory to learning, together with the evidence that it can be trained, has significant implications for music education. It means, to begin with, that children whose individual achievement indicates specific deficiencies can be helped through music. Since music is made up entirely of auditory variables in volume, pitch, and duration, it follows that such experiences as *learning* to sing and play accurately and *listening* to find the identical, similar, and contrasting patterns and sections can actually contribute to the training of the ear of any child.

A study of internationally recognized systems of teaching music to children can be most beneficial to the music curriculum for gifted pupils in grades one through six. Such a study can open up sources of ideas for the enrichment of music programs. Among the teaching systems and approaches that lead the field today, the following are recommended for exploration: the Kodály system in Hungary, the Suzuki movement in Japan, the Orff-Schulwerk technique in Germany, and what is known as the "conceptual approach" in the United States. Together these four present a consensus in some matters; in other matters, a wealth of divergent ideas about teaching young children to sing and to play musical instruments, to sight-read, and to discover and create in the medium of music.

Creative potential, obviously, is of major importance to the education of talented children and youth; it merits particularly thoughtful attention in the music program for gifted pupils in the elementary grades. Educators agree that sensitivity is a strong element of creativity among the gifted; and ways in which this sensitivity is generally manifested include the following:

- Unusual degree of sensitivity to people, involving observation and empathy
- Emerging sensitivity to problems and concern for their solutions
- Overt sensitivity to perceptual stimuli of all kinds

In addition to a high degree of creativeness, numerous other traits are typical of musically talented children. Some of these stem from, are linked with, or lead to creativity. Characteristics of which teachers and other professional personnel need to be continually aware during the educational growth and development of their young charges include the following:

The musically talented child has or shows:

Spontaneous response to rhythm and music demonstrated early
Love for singing familiar and "made-up" songs about everything

Remarkable memory and an ever-expanding repertory
Flexible voice, adequate singing range, and natural intonation
Definite feeling for tonality; gift of relative or "absolute" pitch
Interest, patience, and skill in singing descants or independent parts
An inner-ear association between pitch and visual symbols
Quickness in differentiating between identical, similar, and contrasted phrases in songs and in sections of longer compositions
Choice of music as means of expressing feelings and experiences
The ability to "pick out" familiar melodies on tonal instruments
Marked aptitude for playing introductions, accompaniments, and the like
Special interest in orchestral instruments and a desire to play them
Notable performing skills on one or more musical instruments
Great enjoyment in listening to "live" and recorded music
Keen power of attention, auditory discrimination, and acuity of evaluation
Sensitivity and response to the communicative power of music, even to slightest changes in tempo, dynamics, and tone color
A pronounced capacity for deriving purpose and meaning from melodic and harmonic idioms, themes, variations, structure, motifs, and the like
Ability to hear, identify, and follow two or more rhythmic patterns, metric groupings, or melodic themes played simultaneously
Perception and understanding of subtle interrelationships that exist within and among the constituent and expressive elements of music
A natural sense of aesthetic values (beauty, order, and form)
A feeling of involvement (1) in his own interpretive and/or creative talent; and (2) with the educational process essential to its development

Music, Grades Seven Through Nine

Some of the important musical principles to be included in the education of gifted students in grades seven through nine concern the following:

1. Tension and relaxation as a principle of maintaining interest and motion in music
2. Contrast as a principle of maintaining listener interest
3. Musical "shock treatment" as a principle of maintaining listener interest
4. Aesthetic judgment in considering the varying degrees of subtlety and complexity in music
5. The various schools of aesthetic thought
6. Judgment of the quality of the musical performance

The process whereby young learners seem to discover information for themselves is of great importance in teaching content to gifted students. Thus, the formulation of relevant musical problems to be solved by the students should be given close attention. Certain advantages of such inductive learning are mentioned as follows:

1. In solving a given problem, students become directly involved with the music.
2. Information acquired has real meaning because of such involvement.
3. Applying understanding to similar but new musical situations is more likely to take place.
4. The teacher has an immediate evaluation of how well students understand important concepts. (One can never be sure after a lecture.)
5. The student experiences an immediate and continuing confirmation of his achievement.
6. Ego-satisfaction generated in the student by his success in solving a problem is strong motivation for continued learning.
7. The student develops a sense of his own ability to learn independently.

Music is far from being vague or imprecise. It embodies certain elements of movement – rhythm, tempo, pitch, accent, dynamic shaping, tone quality – which give music a precise shape. By these means, one achieves what is sometimes called "musical sense," even when one is not gifted in music.

The real goal in music education, whether for average or for gifted children, is to expand their perception of this language, giving them the tools to make their own discoveries at whatever level they approach music, not only during their school years but also for the rest of their lives.

The extent to which a child perceives this language (or "appreciates" the music he hears) is directly related to his total hearing experience; that is, to all music he has heard consciously or subliminally since infancy. Any child who has sung a simple nursery rhyme, or has moved and danced to a musical game, already has a neural basis in musical experience on which to build. When this basis has grown to the point of distinguishing one tune from another – for instance, "Frère Jacques" from "Mary Had a Little Lamb" – the young listener has already made memory distinctions in pitch, rhythm, phrase direction, and repetition in similar musical material, however unconsciously. From the multitude of music lovers who cherish their musical experiences, it is evident that this unconscious perception can be developed to a high degree. Why, then, should educators let these perceptions remain on an unconscious level? We give the child the tools of language – the vocabulary and the grammar – that enable him to explore old ideas and create new ones. Should we not also give him the tools of musical thought?

The music program at this grade level should define very clearly many other teaching areas beyond those that are generally stressed. Development of the gifted student's instrumental skills and performance within a large ensemble, with suggestions for practical use, constitute only one of the suggestions that can be made to purposeful advantage.

Music, Grades Ten Through Twelve

Music programs for gifted high school youth will differ from one school to another and must be developed with reference to the overall curriculum, staff, and facilities of a school system's music department; to the students' musical backgrounds, and to the students' social environments.

The following curricular matters, which should be regarded as inseparable from the program, call for careful planning and effective guidance:

1. Facts are of value only as they contribute to (a) concept formation; (b) the ability to draw valid generalizations; and (c) the development of needed musical skills.
2. The development of musical concepts – ideas about abstract qualities of music that lead to an ability to generalize and categorize – should have a high priority.
3. The most important concepts are those concerned with the basic properties of music.
4. The development of skills in performance, reading, functional piano, listening, conducting, and other areas of applied music is of vital importance, although not every student needs to acquire the same degree of proficiency in all skills.

Musically creative students should be given special attention. Indeed, all students should be exposed to music, not only with reference to the art itself but also to its genuine contribution to the full development of the person.

The formulation of musical problems to be solved by the learner, to the extent that inductive or "discovery" learning will take place, warrants the most serious consideration, as does active involvement on the part of the students in developing concepts and formulating generalizations. Gifted students should be allowed many opportunities to grow in the use of simple instruments and of the piano, as well; in the development of both vocal and instrumental skills; in the use of notation for creating and arranging music. These students should also have the benefits of supervised practice, special instruc-

tion by experts, the playing of chamber music, and other valuable experiences.

Creative enterprises on the part of the learners can nurture creativity, afford stimulating experiences for creatively gifted students, yield insights into the creative process, provide relevant learning situations for essential cognitive information, and develop important musical skills.

Curricular efforts that might be made to show interrelationships among the various branches of the arts ought to be based, among other things, on such broad aspects as color, form, movement, balance and symmetry, and tension and relaxation.

The Kindergarten Program

Kindergarten offers school systems the first opportunity for identifying intellectually gifted children. Kindergarten is also the time to identify any outstanding potential and to make referrals for confirmation, to identify intellectual dimensions, to begin a program for enhancing maturation, and to teach substantive skills.

As learners and as social interactors, most gifted young people in kindergarten fit more comfortably into older age groups than into their own. If educators at the primary level could project the characteristics of pupils into high school ages, then nearly all identified gifted girls and about half the number of identified gifted boys would be accelerated not only to protect their self-images and to enhance their relationships with peers but also to help the educational process keep pace with the typically early physical maturation of the gifted child. In California Project Talent half the identified gifted boys were subsequently accelerated. They profited from the experience and retained their social and academic leadership. Schools with predictable gifted populations, then, should systematically reserve places in their first-grade rooms to accommodate kindergarten accelerates.

Kindergarten teachers need structural aids to help them make prompt identification referrals. During the identification procedure, an analysis of intellectual abilities can be made and returned to the teacher for any necessary programming that will benefit the child or children involved.

The *Kindergarten Evaluation of Learning Potential* (Wilson and Robeck, 1966), familiarly known as KELP, provides the materials and the guidelines for referral; at the same time, it outlines preacademic skills to be taught. Based on an analysis of skills needed for success in school learning, KELP describes levels of performance in skills that are identified as critical. Some of these critical abilities

are auditory perception, visual discrimination, left-to-right sequencing, and integration of sensorimotor systems. Although these skills are teachable, they are not necessarily developed in children with high IQs.

Curriculum planning for the education of gifted children in kindergarten should cover subject matter and methodology with care, thoroughness, and insight. Characteristics typical of gifted children at this level should be made clear, and recommendations as to how the talents of such children can be nurtured through the teaching of facts, content, generalizations, concepts, and higher intellectual skills should be made available. More effective ways of guiding and instructing must not be overlooked.

Educators continually struggle against artificial subject-matter lines, and it seems especially appropriate at the kindergarten level for gifted children to integrate and interrelate content whenever and wherever possible.

Mathematics and science can be treated together in the kindergarten program because both disciplines utilize precise, quantitative thinking and logic and, even more importantly, share commonalities for a major strategy that can be used to advantage in teaching gifted children. It is essential, however, that basic structure be taught in each discipline and that the processes involved in each one be emphasized. It is important that both teaching and learning make and sustain the distinction between isolated fragments or bits of knowledge and a broad understanding of the nature and operation of critical principles.

For the gifted young child who does not already read, there are certain minimum facts and concepts he should learn. Among them are the following:

- Words in the English language are read from left to right. It is helpful, but not at all necessary, that the child know the *terminology* of left-to-right; but it is imperative that he know the *directionality*. One easy way to teach the latter is to demonstrate with a comic strip from a newspaper.
- The visual signs called *letters* (combined into words) represent the spoken word.
- A relationship exists between the visual symbol and its spoken equivalent. Reading is a logical, problem-solving situation and not a magic skill possessed only by adults.

The gifted child in kindergarten should progress far enough to learn the following:

- He reads different kinds of materials differently.
- He reads different materials for different purposes.
- He decodes many kinds of things besides alphabetic symbols.

There is an essential interrelationship between history, geography, and economics; therefore, the separation that follows is artificial and is made only to demonstrate how all three merge. The social studies deal with man's behavior and his efforts to fulfill his basic needs. Economics looks at how he does this; history, at when; and geography, where. Geography involves an awareness of forces, conditions, and relationships in *space.* History deals with forces, conditions, and relationships in *time.* The cultural customs, laws, mores, and values developed by groups of men are functions concomitant with the "how, when, and where" of the fulfillment of mankind's needs.

CHAPTER IV

Critical Issues in the Education of the Gifted

This portion of *Objectives, Principles, and Curricula for Programs in the Education of Mentally Gifted Minors* identifies certain issues that are considered critical in the education of gifted children and youth. Questions pertaining directly to these issues are raised, and a discussion follows each question.

Societal Issues

The following questions and discussions have to do with societal issues in the education of talented minors.

1. Which outcomes for the gifted are most valued in contemporary life?

Plato once observed that a society produces in abundance those talents and competencies which are prized in that society. It would appear, then, that pragmatic, prosperous, capitalistic nations have given special support to achievements in technology, management, and mass production. Such a utilitarian and economic bias recognizes practical achievement and values education chiefly for vocational outcomes.

American tradition places individual achievement high among the criteria for personal status. If the accomplishment has been realized "the hard way" against physical odds or lack of opportunity, it is admired much more than achievement gained through easy, natural competence. Achievement in the face of difficulties may have depended on perseverance, strength, courage, skill, or shrewdness, or a combination of these traits; but it is often the occasion of embarrassment when it has been based on an "unseemly" display of cognitive or intellectual superiority.

The scientific trend, the space race, and the extension of specialization have enlarged the market for talent. College – even graduate work – has become so essential for a significant number of occupations that a "doctorate economy" has developed in higher

education and in sciences. The long-standing view that government should not interfere with vocational choice has been ameliorated somewhat by a national policy which promotes technical science. Inducements have been extended through the National Science Foundation, the National Defense Education Act, and other foundations and legislative measures at the federal level to assure a congregation of competent talent to handle issues of recognized importance. Nevertheless, in America political and social leadership has rarely been given to (and has sometimes even been withheld from) these same competent people because as candidates they were dubbed "eggheads." Enlightened government, instead, uses these experts as consultants usually for specific assignments or predetermined tenures.

It is further notable that the competencies of these gifted consultants are more likely to be harnessed for the benefit of practical enterprises, such as conservation of water resources, investments, or technical research. Eventually intellectuals may reach responsible places in government, but they may not be recognized as policy makers.

2. Which goals of education for the gifted are not supported by society?

The American society is generally supportive of the academically gifted individual who moves in the direction of technology and applied research. This emphasis is reflected when our goals for education are defined hierarchically by such terms as economic efficiency, civic responsibility, development of self, and aesthetic appreciation; but the primary emphasis has always been placed on economic efficiency. It is implied that this goal will somehow eventuate in civic responsibility, self-development, and aesthetic appreciation, all of which will naturally follow as a consequence of our educational programs. These latter goals, of course, are too important to the person and to the country to be neglected in conceptualizations of educational programs for the gifted, and certainly too vital to be left to a "spread of generalization." Spread of generalization may be defined as fringe-type learning, not specifically taught.

Society is frequently impatient in its expectation of quick solutions or of immediate return on any investment made in the education of its most able. Hence, society is more likely to support short-term goals for the gifted rather than to indulge time and personnel in the careful long-range, cutting-edge planning necessary

for the achievement of these less precise, long-term developmental goals.

3. Do schools neglect individuality, inwardness, and security from inner resources?

The shift from rural to urban life, the change from handicraft to industrial work, the growth of massive society and remote government, and the move from personalized to organized welfare and recreational activities all tend to suppress individuality and to increase group characteristics of behavior. Any thinking person who is assigned a fragmentary task in a massive industry, who meets his community responsibilities through organized services, or who participates in legislation only through pressure groups, eventually must get glimmers of insight into his limited power. The less strong, the more frightened, and even the competent who have learned well in any excellent but narrow educational system fall easily into this pattern of being "other-directed."

Schools are major social institutions for reflecting values of mass society. Generally, they are expected to inculcate group ideals and socially valued skills. Specifically, they are the chief instruments of group instruction, and their effectiveness is evaluated on the basis of the average academic gains or expected common social development of children more than on the basis of the unusual or unique development of individual potentialities. Even though schools may verbally stress individuality, the main evidence of its status or development is often relegated to individual report cards. And yet it is expected that these same children, who are constantly bombarded toward nonevaluative conformity by the Madison Avenue, Hollywood, and media network people and their values, will somehow, in some magical way, learn or develop individuality of responses. In a sociological setting where spectator recreation facilities indoctrinate preferences for appearances and tangibles and where advertising promotes immediate self-gratification and obligatory belongingness, there is additional suppression of unique or distinctive human capacities. As a consequence, enthusiasm and motivation are nurtured for what is popular or salable over what is accurate or beautiful. (This state of affairs is the full bloom of Plato's predictive observation.) Like the public media, schools, too, are caught up in this dedication to "what others expect." The schools, however, can offer some resistance by encouraging and teaching evaluative, reflective techniques of communication. In this manner, standards of

individual excellence, critical thinking, and deliberative analysis can be established.

4. What should the gifted person contribute to society? or – Does the gifted person's ability bring about special responsibilities?

It is generally assumed that democracy has a unique advantage in drawing group gains out of the dynamics of diversity and individuality. Some authorities argue that social ends and national purposes are best served by individual development that maximizes diversity among individuals.

Usually the gifted are expected first to meet the common requirements and then to contribute in special ways. In school they have been expected to perform above the average in carrying out common tasks, with the additional expectation that they should accomplish more work, demonstrate more knowledge, make more logical use of facts, and show more persistence. Educators have long felt that both school and society frequently fail to meet reciprocal responsibility. However, there is no consensus as to whether innovators, researchers, and scholars should receive special encouragement, support, or protection from society. It is true that for some years observers have pointed to an enduring and natural alienation between the common man and the man of genius, and historically this may be true. The democratic values held by Americans actually intensify this alienation; and it should be apparent to the detached thinker that the words "all men are created equal" have been often misunderstood and misapplied. Nevertheless, even though the estrangement between gifted and nongifted people may appear to be inescapable, educators who teach gifted students support John Gardner's position in his book on excellence (1961) in which he proposes that society support excellence and promote individual fulfillment. While most talented persons naturally have a sense of obligation, devotion, and responsibility, Gardner recommends that such values be developed in persons who do not have this natural sense.

Many writers have recently applied the term "gifted" to a comparatively large group of individuals who are capable of contributing something above average in any socially useful area. In this view, creativity, which is almost universally present in fulfilled people, is manifested in works of imaginative arts and crafts, industry, homemaking, and so on. From this point of view, every fulfilled person with larger-than-average potentiality is a significant contributor to his community.

Case data indicate, however, that special contributions are made usually by the singularly gifted. Numerous publications and articles issued by the California State Department of Education in the past decade contain discussions of the singularly gifted; and elsewhere in the nation, the amount of literature on this subject is increasing. It is significant, moreover, that findings in the Stanford Studies as well as findings in other studies of giftedness are consistent with data from a recent follow-up study of fellowship students at Columbia University – all of which suggest that self-realization is normally compatible with socially valued achievement.

5. What is society's responsibility to nonparticipating gifted individuals?

There are always very able individuals who choose neither to participate in society nor to accept the goals of the middle class. Alienated youth have always been a part of society; but during the past 10 to 12 years, this minority (beatniks, hippies, militants, and unlabeled "rebels" and protesters) has become more visible and more frequently heard, mainly because of television and also because it has been increasingly open in its rejection of the middle-class pattern of American life.

Society and education both have a responsibility to help the intelligent young person to develop socially and to teach him how to make rational choices. He must not be provoked to adopt a deviant style of behavior by the magnetism of his peers; or by the ephemeral pull of society's commercial mass media; or by his temporary hostility toward a parent, teacher, or any other adult authority whom he considers unjust.

Certainly our schools should tolerate and encourage socially acceptable divergence among youth. The wiser among us know that too frequently the only opportunity for constructive divergency is during the school years, and we also know that much too soon the child is an adult with adult responsibilities.

Although one cannot fully ensure that any gifted child or youth will not pursue an alienated or antisocial life, the educational milieu that provides opportunities for the natural development of individuality as well as for personal counseling will have reasonably discharged its responsibility for enabling the young person to explore alternative roads to selfhood. It is infinitely more likely that students in such an environment will not be driven to a pattern of adult alienation from society because of a neurotic animus which they may not understand.

6. What special problems of the gifted arise under present cultural conditions in the United States?

The social climate in the United States historically has placed emphasis on (a) the completion of tasks quickly and efficiently; (b) the paramount aspect of physical prowess; (c) the denial of time for reflection and introspection; and (d) the exterior stimulus value of the person. Over the years it was traditional for society to pay tribute to the person who chose a way of life that brought him, in a short period of time, to a great amassing of wealth through legal means.

The *Zeitgeist* of today's youth, however, is the rejection of many of these aspects of traditional American culture. A large number of the younger generation are unashamedly turning inward, seeking spiritual experiences in preference to other experiences, and attempting to put into effect the truths of religion and democracy. Their de-emphasis of monetary goals, their refusal to spend inordinate amounts of time and effort in search of status, and their refusal to accept double standards of behavior and morality are representative of values that make their elders uneasy. It is one thing for a person to *think* he has been religious, democratic, generous, and honest; but to be confronted with the charge that there is a disparity between his thoughts and his actions is quite another. Modern youth's demand for this kind of confrontation widens the gap between the generations. Possibly for the most part, the elders are making their peace with compromise; they prefer, realistically, to "let sleeping dogs lie."

The gifted young American is very much influenced both by the culture of the past and by the spirit of his own generation. Conflict may arise when we emphasize the importance of independence of thought, of critical analysis, and of joy in one's work, as well as the necessity of departing from the herd occasionally. A significant role of education is to guide and encourage the gifted student while he is seeking out his rightful identity. This is almost too difficult a challenge for him when he struggles between the magnetic fields of force exerted by the contemporary peer culture on the one hand and by the anti-intellectual attitudes of many of the older generation on the other.

School-Related Issues

The following questions and discussions have to do with school-related issues in the education of talented minors.

1. How effectively are we now able to identify the gifted?

Gifted children are not easily identified. They often live in situations that inhibit unique behavior, or they assume a protective disguise of averageness. Above all, gifted behavior is markedly flexible and rare; it is not easily defined, categorized, or measured.

Educators have had to use multiple criteria for selecting the gifted. A New York survey found that 76 percent of all schools used four or more criteria while less than 2 percent depended on a single criterion. An intelligence test score is found in most combinations.

Intelligence tests are treated sometimes with overconfidence, sometimes with great apprehension. Obviously, an attempt to develop standardized and reliable measures reduces both the spectrum and the spirit of what is measured. Rejection of IQ tests is based less often on test inadequacy than on the social consequences of test application.

An individual intelligence test is an efficient instrument; its administration and interpretation, however, require trained personnel, and the cost of their services is prohibitive for many schools in some states. In practice, IQ scores are usually drawn from a paper-pencil or group intelligence test. A number of studies support the conclusion that a group test can be used efficiently to screen a group for high-potential students, provided that the "crucial minimum" or "cutoff" is low (probably one standard deviation above the mean, or IQ 115). Most of the truly able will thus pass the first criterion. From this group, then, a hierarchy can be established, and its members can be further measured.

Subsequent measures may include an individual test. Often achievement scores and teacher nominations will be added to the selection criteria as economy measures, but both of these present such problems regarding reliability that the economics of a decision based on either one type or both types must be questioned. Intellectual capacity is not manifested equally in all school tasks; for example, arithmetic, in one achievement test, may be heavily loaded with computation and practice, while in another it may be dominated by problem solving, reasoning, and intuition. In general, teachers are aware of such signs of giftedness as early reading, large vocabulary, wide-ranging interests, desire for knowledge, originality, ability to transfer information, and excellent memories; but, unfortunately, teacher nominations of students to be tested for giftedness are usually overloaded with names of those who are orderly, neat, persistent, conforming, and accommodating. Guidance personnel

have attempted to circumvent such judgment by developing checklists designed to include more successful screening criteria.

As shown by public concern for the underprivileged, the educational fallout from social class, ethnic, and religious groupings is a problem under increasing consideration today. Individual talent among many young people is often submerged because of lack of opportunity and lack of recognition. Such skills and values as adroit verbal inquiry, good use of formal English, delayed gratification, system-mindedness, and respect for authority are known to heighten school achievement. But these things are not usually transmitted in underprivileged families. The disadvantaged child who has not learned *how to learn* from adults is "motoric" more than reflective, and he probably has a sense of alienation from teachers because he cannot fit into school expectancies. There is considerable evidence that when giftedness is found in the lower-class child, it is likely to be manifested or discovered in those families who are upwardly mobile and who accept middle-class values.

The limitations of identification procedures support an argument (a) for flexible and impermanent classification; and (b) for research on identification procedures that will develop evaluation tools genuinely usable in working with and measuring the less privileged. This kind of project is currently being undertaken in California.

2. Does preschool experience determine whether or not a particular child will be defined as mentally gifted?

Joseph Hunt (1961) and David Ausubel (1958, 1968), among others, have documented and researched the importance of preschool experiences and of planned environmental nurture in the development of the young child.

The preschool period is exceedingly important for language acquisition and conceptual development. It has been hypothesized that experiences during the period between age three and age seven are especially critical if the child is to grow through the preoperational thought level and reach the concrete operations level postulated by Piaget (1959, 1960).[1]

In past years it was traditional that children who were less verbal and who had not developed eye-hand dexterity for paper-and-pencil tasks were less likely to be selected, on the basis of reading readiness tests, as highly able; and this tradition persists even today. It is most important, therefore, that educational efforts be directed toward

[1]See also Flavell's book (1963) on the psychology of Jean Piaget.

providing "learning-to-learn" experiences during this three-through-seven-years-old period so that all children may have the necessary experiential base which will allow them, if they are able, to develop intelligence and to build prerequisite academic skills. Preschool and nursery school curricula for disadvantaged young people will have to include learning other than social skills.

3. How should school programs be conceptualized?

Are there broad outlines for a general plan? Should the gifted participate in a distinctive curriculum? Are there outcomes that would not be offered to other children?

Many discussions about the education of gifted children and youth are more concerned with identification and administrative policies than with making the educational process itself the major focus. Certainly, if we begin with a child who is already superior or talented, then the emphasis should be on fostering superior development in cognitive, social, and affective spheres. The enhancement of effective problem-solving techniques, the development of critical thought, the fostering of individual resourcefulness and self-sufficiency are all major goals which need precise structuring and planning.

4. Where should individuality and creativity be placed among the educational goals?

Creativity and individuality are often viewed as personal goals that conflict with group welfare. This view is, however, a very limited one; a society would become paralyzed and ineffective if it lost its capacity for adaptation and rejuvenation. The school, then, at its very best, should contribute to both goals, preparing the group to welcome and assimilate useful innovation and helping the innovator toward competence and compassion.

Innovation and creativity are too often described as special processes quite apart from daily learning and thinking.

Work that is innovative, imaginative, or creative makes a special demand on the vitality of the individual and calls for special zeal and daring to go beyond the edge of what is known. The promotion of creativity, then, is hinged to the development of values and personality. Highly individualized or creative outcomes rise from a complex of knowing and feeling. They are shaped by formal learning, classroom affects, family values, unique personal experiences; and they are derived from total personal development more than from a specific or organized program.

Educators realize that narrow curricula, enclosed communities, and very highly organized activities all lead to efficiency and high adequacy but that the consequence is equal performance from person to person. There is real need for knowledge about how to teach the use of imagination and the art of innovation.

5. Can schools foster the development of special talents?

American elementary and secondary education has been dedicated primarily to the development of general educational objectives. Thus, the child who displays a special talent or interest in one specialized area, such as voice, violin, ballet, sculpture, composing, graphic arts, or, for that matter, leadership, might be neglected, while the child with outstanding athletic skills, scientific interest, or an ability to play a band instrument is apt to receive special attention.

Here and there throughout the United States, schools that specialize in the development of students with certain talents may be found. It would appear, however, that any articulated educational program for gifted minors from kindergarten through high school should afford opportunities for the development of a wide variety of special talents. Beyond this provision, the school should serve as a referral source to teachers, as well as to performers, scientists, and other personnel in the community, who are willing to work with the highly skilled student in special endeavors.

6. Is the modern technology of education particularly effective with gifted children?

The modern technology of education includes the following: teaching programs and teaching machines, talking typewriters, specially prepared filmstrips and film loops, tapes and tape recordings, equipment for computer-assisted instruction, computer console connections with electronic storage units, various telephone and television systems for the classroom, and many other innovative devices and systems. Many of these have built-in features for (a) incremental learning, paced according to the learning performance of the pupil; (b) feedback regarding the responses elicited by the learner; and (c) determination of the learner's progress by means of electromechanical recording of performance.

For the gifted boy or girl, these devices and facilities may enhance educational development; however, the printed word remains the most important source of information. Furthermore, in teaching talented young people, one must be aware of the importance of emphasizing personal discovery as well as unique ways of solving problems. Much of the current technology emphasizes convergent

thinking and process following, and from this standpoint it has limited utility for the gifted. One should not overlook that, for the adept learner, rote learning and memory skills are relatively easy; this young individual needs much more. Among other things, he needs discussion and dialogue with peers and with teachers to help him test his ideas and enhance his personal development. If technology were to dominate educational programs for the gifted learner, he would surely miss some of the excitement of discovery and the joy of interrupting the pace of his program to follow up an idea.

7. Are there special considerations for the evaluation of outcomes in the education of the gifted?

Evaluation patterns should derive from the instructional goals that have been established and, in turn, should act as guidelines for these goals. For many children a fundamental goal is to meet a minimum standard that can be explicitly stated. When goals include advanced knowledge, thought, imagination, and the maximizing of unique potential, different evaluation procedures must be used.

8. Should the teacher of the gifted be a special teacher?

A few biographical studies of teachers who have helped gifted children to achieve remarkable gains are available. These studies indicate that the gifted prefer to be taught by teachers who have qualities most like their own; for example, high intellect, flexibility, humane motives, a sense of humor, curiosity, personal magnetism, sensitivity to others, wide-ranging interests, receptivity to help from other people, enthusiasm for self-improvement, outstanding scholarship, and excellent organization from which they – the learners or the teachers – can depart at any time.

Other important characteristics are described as follows:

1. The teacher of the gifted must be one who adapts instruction to individual differences and who develops in these young persons an awareness of the qualities of giftedness.

2. The teacher of the gifted must be competent and comfortable with respect to flexible approaches and workshop processes, the forming of hypotheses and brainstorming, and the nonconforming ideas that characterize intellectual competence.

3. The teacher of the gifted must be free of lock-step and piece-by-piece approaches. He should have a preference for "gifted methods."

4. The teacher of the gifted needs intellectual energy and competency. There may be some dispute over whether or not the teacher must be intellectually gifted; but there is no dispute that the

teacher must be able to structure ideas, raise stimulating questions, and give leadership to curiosity and have the necessary stamina to continue such leadership. Whether the ability is from training or from nature, the teacher needs a flexible and lively hold on the subject matter.

5. The teacher of the gifted needs self-sufficiency and generosity. The instructor who is threatened by a sense of inferiority or is moved to competition with bright learners will not do well with his charges.

6. Most of all, the teacher must not be a hostile person. Several contemporary writers maintain that in our society there is a widespread adult *animus,* or dislike, for gifted and creative children. They use Nietzsche's concept of *ressentiment* to explain this observation. *Ressentiment* involves a partly unconscious tendency to punish ingenuity and joyous excitement in able children. These writers contend that the problem reaches serious dimensions in the high school because some specialized teachers covet reputations as scholars and, failing to fulfill that desire, react negatively to superior learners. These observers believe that most elementary teachers value themselves as teachers and so are not in conflict with intellectually competent children.

Other Issues and Concerns

Many issues and concerns other than those discussed here have been treated in textbooks on the education of the gifted. One such concern is the type of administrative grouping advocated for the very able learner. There have been heated arguments over special-class grouping versus day-long grouping, segregation versus enrichment in the regular program, and so forth. Some of the state program types seem especially suited to certain children, certain school districts, and certain communities. Teachers who are highly skilled in providing for individual differences could conceivably teach well within any of the administrative structures advocated in the past.

Grading practices have been an Achilles' heel in many programs for talented minors. Students and parents frequently shun special classes for the gifted because the boys and girls enrolled in such classes might possibly earn lower grades and thereby encounter difficulties in gaining admission to some colleges. For this problem no solution appears to be in sight. The inflexible teacher will still attempt to grade a group of gifted learners on a curve, and whether the majority of colleges give deference to an "honors B" or not, students so graded can be severely penalized when they apply for scholarships.

An important and neglected issue in the education of gifted children and youth is the need for articulated programs from kindergarten through senior high school and beyond. All too often, programs for the gifted result from one educator's enthusiasms at one particular level of the school program. Such programs are hastily conceived and frequently last only a short period of time. Sound programs for talented young people must be related to the entire curriculum, to every level of the school, and to the mainstreams of education and community life.

CHAPTER V

Evaluation of Curriculum and Instruction for Gifted Students

The fifth chapter in this preliminary publication identifies and discusses important aspects of evaluating the education of talented minors. Part One deals with goals and problems of evaluation; Part Two, with the assessment of characteristics of the gifted. An appendix presents a sample instrument for use in evaluating educational experiences planned for very able learners. Close attention and careful thought have been given to the content of this chapter, the basic assumption being that consistently high standards in special education for the gifted are not likely to be maintained without frequent, honest appraisal.

PART ONE

GOALS AND PROBLEMS OF EVALUATION IN THE EDUCATION OF THE GIFTED

The complexities of modern education place special problems before those personnel who evaluate the effects of new approaches to curriculum development and instruction. The tasks of evaluators are compounded by rapid transitions from old to new programs; by the discovery of needed modifications in programs already implemented; by complex theories about the nature of the learner, today's society, and the structure of content; and by failures to incorporate evaluation into the strategies of educational planning.

When curricula and programs are designed for gifted students, evaluation is fraught with additional difficulties; rigorous research or experimental evaluation is rendered most difficult, if not impossible. Realizing that his responsibility is first to the students and second to rigorous research design, the evaluator cannot divorce himself from the problems at hand but must on many occasions compromise his ideals and cope with the realistic world in which innovative programs for the gifted occur.

This real world frequently presents the evaluator with the chore of appraising a program already planned and in progress, or sometimes

even completed. In this situation the evaluator has little or no authority or even opportunity to act in guiding policy decisions that may be crucial to the evaluation. In addition, the evaluator is rarely given the authority by the decision makers to implement the program changes or modifications that would enable him to evaluate the program more effectively or more positively.

There are no shortcuts to serious evaluation, particularly since the educator's knowledge of the behavior of learners continually changes with new advancements in research. Early theories of general intelligence have given way to theoretical models of intelligence. Although still in hypothesis-testing stages, these models offer far more specific and more meaningful avenues for incisive evaluations. Each new insight brings about a demand for new approaches to the design and for the testing of curriculum and instruction.

Much greater attention has been given to curriculum reform than to an examination of the effects of the new programs, which include the reorganization of instructional methods and the restructuring of content. Educators find themselves hard-pressed to keep pace with changes in content and methodology. They seldom have adequate time or resources to prepare and to carry out serious studies to determine the extent to which the programs are fulfilling their objectives. All too often, the very objectives on which the programs are built are so stated as to defy a meaningful interpretation in terms of student behaviors that *can* be assessed.

Note, for example, some of the techniques now applied to the education of gifted children:

Individualized instruction
Attention to behavioral objectives
Programmed learning and computer-managed instruction
Team teaching
Nongraded and continuous-progress plans
Use of specialized personnel
Provision of supplementary learning centers
Infant and preschool education
Creativity-stimulating curriculum innovations
Artificial stimulation of intelligence
Use of tutorials
Simulation of "real world" experiences

Evaluation becomes increasingly difficult when special populations of students are the targets of exemplary and innovative programs. Most researchers and practitioners now agree that curriculum, instruction, and materials must accommodate a multiplicity of learning styles and needs which are continuously being brought to

light by ongoing research. Unfortunately, the theoretical systems underlying the efforts to meet these needs are still relatively unarticulated, and the evaluation schemes that follow in their footsteps too often depend solely upon expert rational judgment and subjective evaluation rather than include empirical assessment of instructional effectiveness and utility.

Considerable difficulty is presented to the researcher who is used to dealing with the concept of global ability and with instruments that measure general achievement, when the works of Guilford (1967) And Torrance (1962, 1965) have convincingly demonstrated the existence of many cognitive gifts the development of which is essential if the full potential of the gifted is to be realized, and when the works of educators writing in the field of the social sciences have shown that behavioral objectives can make sense of many of the concepts about global achievement.

The shift from a concern for general intelligence and achievement to a concerted effort to develop many specific cognitive abilities and content achievements will result in less emphasis upon lock-step material and more emphasis upon creative, judgmental, and higher-level abilities and achievements. Such a shift can place great burdens on the researcher in his attempts to test the effects of efforts to develop many specific behaviors, when in past years one test of achievement of lower levels of cognitive learning would have sufficed. The vagueness of objectives and of measurement in the intellective, affective, and content achievement domains is another major source of difficulty when the purposes of instruction are established for educational development in those very domains.

Two additional major problems face the evaluation of special and, for that matter, all other educational programs:

First, the superimposing of new techniques of evaluation over old ones confuses rather than illuminates. The rapid development of research in educational evaluation has created a burgeoning, disorganized collection of concepts, facts, generalizations, and research instruments and methods that pose many contradictions and inconsistencies, because new conditions and new assumptions are introduced to solve the new problems without the necessary review of the changes which they create in the relevance and logic of the older structure. In short, the methods of evaluation must themselves be evaluated before being applied in new situations.

Second, the results of evaluative studies must be communicated to the public and to the practitioners in terms that may be understood. This is no easy task, for distortions of meaning can take place when

technical and scientific language is converted to terms that the layman can understand, and oversimplification may raise great hopes among laymen when only glimmers are perceived by researchers. Special personnel should be trained in the communication of evaluation and research findings if the results of the evaluator's efforts are to find their way into practice or if the results are to be adopted by legislators, school district governing boards, teachers, and administrators who may not have sufficient interest or competence in research.

Assumptions Underlying the Evaluation of Programs for the Gifted

The evaluation of programs for the gifted, like all viable evaluations, requires that objectives or goals be clearly stated and that criteria be established to determine the extent to which the objectives and goals have been met. This charge is based upon the following six assumptions:

1. There exists an identifiable group of students who may appropriately be called the academically gifted.
2. The objectives and goals of instructional programs for the academically gifted can be conceptualized and may well depart in several meaningful respects from similar instructional programs designed for typical students.
3. Curricula and instruction can be designed and implemented to achieve the stated objectives and goals.
4. Programs for the gifted and for others should be based upon sound implications from evidence, and part of this evidence must come from good empirical research. Sound research can test the effectiveness of new programs and establish principles that will suggest new procedures for educating the gifted as well as others.
5. Suitable research arrangements in schools and laboratories and appropriate tools and techniques of measurement and evaluation can be developed for conducting research on the academically gifted.
6. Decisions about the goals, objectives, and educational programs for the academically gifted must also be based upon philosophical considerations and value judgments that result from rational thought.

Identification of the Gifted

The first of these assumptions begins, as it should, with the learner. By the very nature of a concern that is felt for the education of the gifted as a segment of special education, the evaluator must know by which process the students are selected. The most commonly used identification procedures include the following: (1) group intelligence tests; (2) teacher judgments; (3) school records that include achievement test scores and teacher grades; (4)

individual intelligence tests administered by qualified persons; (5) appraisal of social and emotional maturity and adjustment; (6) parent interviews; and (7) assessment of pupil ambition and drive. It is well to note that procedures 1, 3, and 4 are notoriously inappropriate in many respects for this task; that procedures 2, 5, and 6 are disastrously vulnerable to bias and subjectivity in most cases of their application; and that procedure 7 is virtually impossible with today's technology. In fact, it is little more than a commonly held hope of researchers and educators of the gifted that the identification procedures really do identify the gifted with any degree of accuracy. Problems that arise from identifying the nongifted as gifted (errors of commission) reveal themselves quickly and tragically, while errors of omission rarely are revealed.

Much may be learned, however, about these students through an identification process that is as objective, as continuous, and as effective as possible. We can only infer the students' characteristics from a statement of their educational objectives, the design of their curricula, the planning of their instruction, and evaluation of their progress. Ideally, identification and careful planning should begin at the earliest possible age of the child. Because education is a process of changing behavior, early identification will most effectively help to determine educational needs; that is, the gaps between what is and what should be the behavior of the child.

The school district's decisions regarding identification or selection procedures and the time that identification will take place – or what student records will be utilized as selection criteria – will be a major factor in determining the nature of the program and the resulting evaluation.

Once begun, the accumulation of data concerning the child and his progress should be continuous, as should be the feedback data to teachers and to curriculum specialists. The most useful service evaluators can perform is the identification of aspects of the program wherein revision is needed. Interventionist evaluation, employed to improve the program while it is still fluid, contributes more to the improvement of education than the traditional type of evaluation used to appraise a product already on the market.

The process by which a school district decides that it will provide special programs for academically gifted students and identifies them for participation will have much to do with further policies and procedures to be employed in curriculum selection or development, in instruction, and in evaluation. Concerning this process, it is evident that evaluation must (1) be taken into account; (2) be

planned into the total instructional design at the beginning; and (3) contribute throughout the program as formative (or modifying) evaluation. Formative evaluation is a continuous process of testing, documentation, analysis, and instruction. As the changes are made, new criteria are established for further examination with the objective of improving learning opportunities and student performance. This form of evaluation must begin with the origin of the program and selection of students. Identification, therefore, is a vital aspect of evaluation.

Determination of Education Objectives

The second of the six assumptions states that the objectives of instructional programs for the academically gifted can be conceptualized. If children are identified for special education, it should follow that special instructional programs will be designed to meet their particular educational needs. Unless a school can clearly identify such provisions and indicate how they implement the goals and objectives, it is quite likely that nothing singularly pertinent to the gifted group exists; rather, that old products have simply and dishonestly been given new labels.

It would seem that the identification of learners for special educational opportunities should spring from dissatisfactions with prior programs. The nature of these dissatisfactions is an important beginning point for the construction of evaluation procedures. The selection of learners to participate in special educational programs and the determination of educational objectives must go hand in hand. The unique characteristics of learners should be used in the learning process; strengths and weaknesses in verbal, numerical, and spatial abilities are important criteria. Objectives should show both the kinds of behavior desired in students and the kinds of content to which these behaviors are to apply.

Contemporary Models as Bases for Testing

Presentations of powerful concepts are now available to those who are planning educational objectives. These include Guilford's "Structure of Intellect" model (1960, 1967) and the *Taxonomy of Educational Objectives*, prepared by Bloom, Krathwohl, and others (1956, 1964). While Guilford's model has been employed widely in the construction of tests of new and vital student behaviors, particularly for the gifted, it has not been widely translated into concepts readily employed by program planners or evaluators. The major contribution of the *Taxonomy* lies in its delineation of the

intellectual skills and abilities by which the student learns; it has not been effectively translated into the building of useful test banks to aid in the measurement of those learning objectives.

The major categories of Bloom's taxonomy – knowledge, comprehension, application, analysis, synthesis, and evaluation, as well as their subclassifications – may be integrated with six instructional elements operating in the school environment: teachers, students, methods, materials, times, and places. Chart A presents the results of an analysis of factors involved in the learning process and a basis for a comprehensive evaluation of curricula and programs.

Hoepfner and Klein (1970) provide models for the conceptual descriptions of educational goals and objectives that are quite adaptable to the planning of curricula and instruction and the development of a test pool. Development of a test pool at the school or district level enables flexibility in local curriculum development. The process involved in arriving at decisions as to the model that will provide the paradigm for test-item construction should include specialists and practitioners. Construction of such a pool operationally defines the goals of the course and provides a pool from which the final examinations can be constructed.

Development of a test pool can help to bridge the gap between the formulation of specific objectives and tests that are normed on national or regional populations. Global instruments will not aid the curriculum developer, evaluator, or teacher in finding out whether his specific behavioral objectives are being accomplished through instruction. National achievement and ability tests will not generally help one to discriminate the relative success or failure of instruction designed according to a hierarchy of intellectual characteristics. The published tests were not designed for these purposes and should not be expected to go beyond their purpose and dimensions as presented in technical reports and manuals. The creation of test items for specific objectives, curricula, and instruction must be a part of the instructional planning process.

If the objectives of the instructional program can be conceptualized, they can be tested. Conversely, if the objectives are not stated in terms that can be tested, they are probably too broadly stated or too poorly conceived to be of much value in the first place. Participation of an evaluation specialist in the formulation of objectives through the creation of test items and performance measures will help to bring goal statements from unusable platitudes to workable avenues for planning.

Chart A

AN ANALYSIS OF VARIABLES INVOLVED IN THE LEARNING PROCESS

TYPES OF LEARNING	WHAT STUDENTS DO		WHAT TEACHERS DO		APPROPRIATE ORGANIZATION AND LOCATION			
	Activity	Tangible outcomes	Activity	Tangible outcomes, objective tests	Methods used by teachers and students	Materials used by teachers and students	Times used by teachers and students	Places used by teachers and students
MASTERY OF SUBJECT MATTER (KNOWLEDGE) (MEMORY)	Responds Absorbs Remembers Rehearses Covers Recognizes	Objective test results Completion of program learning sequences	Directs Tells Leads Shows Delineates Enlarges Examines	Programmed materials	Lectures Drill Recitation Objective test Homework	Textbooks Programmed materials	Formal Regularized	Large group Classroom
COMPRE-HENSION (COGNITION)	Explains Demonstrates Translates Extends Interprets	Short essays Objective test results	Demonstrates Listens Reflects Questions Compares Contrasts Examines	Objective tests Essay tests	Objective test Essay test Recitation Socratic dialogue	Audiovisual materials Television Natural phenomena	Formal Regularized	Classroom Typical group
APPLICATION (CONVERGENT AND DIVERGENT PRODUCTION)	Solves novel problems Demonstrates use of knowledge Constructs	Problem-solving tests Construction of equipment	Shows Facilitates Observes Criticizes		Laboratory Shop Homemaking center Stage Project Quiz Contests Study trip	Building materials Shop equipment Lab equipment	Informal Regularized	Laboratory Shop Field station Small group
ANALYSIS	Discusses Uncovers Details Lists Dissects	Experimental write-ups Précis Outlines	Probes Guides Observes Acts as a resource		Seminar Discussion Group critique Independent study Précis writing	Books (not textbooks)	Informal Irregular	Cubicle Laboratory Seminar room Home
SYNTHESIS	Discusses Generalizes Relates Compares Contrasts Abstracts	Term papers Blueprints Sets of plans Critiques Essays Speeches Projects	Reflects Extends Analyzes Evaluates	Reading lists Specialized question	Term paper Essay Planning of project Consultation Seminar Independent study	Collections of books	Formal Irregular	Library Home Seminar room Concert hall Museum Laboratory Small group
EVALUATION	Engages in commitment Judges Disputes	Performances (athletic, musical, artistic)	Accepts Lays bare the criteria Harmonizes	Debates – global problems Competitive essays – project constructions – shop Speech tournaments – structural ideas	Seminar Panel Outside lecturers Debates	Essays Journals	Informal Irregular	Seminar room "Coffee shop" Small group

In the intellectual domain, an excellent consideration of the Bloom and Guilford models has been prepared by Plowman (1971) in Chart B, which may serve as another aid to the organization of educational objectives from evaluation procedures. The matrix presents a statement of factors that affect educational programs, school experience, and the development of human potential when conceptualizing higher intellectual skills and traits of creativity. The chart may also serve to indicate shortcomings of existing programs for the gifted. (See opposite page.)

Student Feedback Methods in Program Evaluation

The third and fourth assumptions propose that curricula and instruction can be designed to achieve the posited objectives and that good research is an integral part of the process. A promising research method may be found in the use of student feedback. Such an approach might address itself to the following questions:

1. What empirical evidence demonstrates a positive relationship between successive cycles of testing and modification to increased learning and shows applicability to diverse subject areas?
2. How effective are various developmental testing procedures in terms of producing instructional programs of high validity for specific target populations?
3. At what point does the cost of further developmental testing exceed the corresponding gains in learner performance?

These three basic questions can be partially answered by the findings of researchers who have already explored some factors related to instructional programming. Early efforts in this area suggest that study with self-instructional materials modified through iterative cycles of face-to-face tryout, revision, and testing will result in significantly better learning than study with material covering the same subject matter but revised only on the basis of after-the-fact analysis of responses to study item questions, and/or examination of criterion test results, and/or subjective feedback from instructors. The process of iterative tryout, revision, and testing, based on tutorial interactions with students, has been identified with programming procedures described as behavioral engineering.

The strategy of formative evaluation is employed through the process of continuous program monitoring and revision. In this instance the reactions of learners to instructional methodologies and practices serve as guidelines to be considered in formulating objectives and in establishing goals against which student perform-

Chart B

HIGHER INTELLECTUAL SKILLS AND TRAITS OF CREATIVITY*

Variables That Affect Educational Programs, School Experience, and Development of Human Potential

Listed on this chart are certain intellectual skills and certain traits of creativity. Complete the chart, indicating which skills and traits receive a major emphasis in stated objectives, classroom dialogue, assignments, curricular materials, and examination questions in your program for gifted children or in your talent development program.

Intellectual Skills	Educational objectives	Classroom dialogue	Assignments	Curricular materials	Examination questions
1. Translation					
2. Interpretation					
3. Extrapolation					
4. Application					
5. Analysis					
6. Synthesis					
7. Evaluation					
8. Divergent thinking					
9. Convergent thinking					
10. Evaluative thinking					

Traits of Creativity	Educational objectives	Classroom dialogue	Assignments	Curricular materials	Examination questions
1. Sensitivity to problems					
2. Adaptive flexibility					
3. Expressional fluency					
4. Originality					
5. Extending awareness					
6. Overcoming obstacles to thinking					
7. Overcoming obstacles to doing					
8. Providing new and worthwhile products					

*This chart corresponds to the one presented in the booklet, "Gifted-Child Education and Talent Development Program Checklist," p. 8. See under Paul D. Plowman (1971) in the Selected References.

Note: In the left-hand column, numbers 1 through 7 are based on the *Taxonomy of Educational Objectives: The Classification of Educational Goals – Handbook I: Cognitive Domain*, prepared by Benjamin S. Bloom and Others (1956); numbers 8 through 10 are based on the writings of J. P. Guilford concerning the "Structure of Intellect" model (1960, 1967). See the Selected References.

ances will be tested. Under optimum conditions, summative (or payoff) evaluation would be of little or no real value other than for the purpose of conducting comparisons with student populations in other regions or against national norms.

The regional or national application of testing has utility only when the educational objectives are the same in all areas. As more specific educational objectives are written and if the tests are to serve as guides to the improvement of instruction, there is less direct application for broad-based testing other than under the most generalized conditions. The inadequacy of standard achievement tests is particularly evident in measuring the growth of gifted students when evidence concerning such characteristics as creativity, originality, ability to do creative thinking, and leadership is considered important to the educational program. Recent national policies and programs in education, however, run counter to the in-house, objectives-based evaluations. It is probably true that we shall continue to need both testing strategies for some time to come.

Arrangements for Research

The fifth assumption holds that suitable research arrangements in schools and laboratories and appropriate tools and techniques of measurement and evaluation can be developed for conducting research on academically gifted children and youth. This position is at the same time a plea for support of evaluation efforts if quality programs for the gifted are to be seriously pursued.

Relevant, thorough, and continuous evaluation procedures must be developed and implemented so that educators can bring about improved identification and placement programs, improved methods of instruction, improved instructional materials, desired behavioral changes, and the curriculum offerings that meet the demands of a changing society.

If each of the goals in the foregoing is to come from the instructional program, the procedures by which they are measured must be planned from the outset of the program. Evaluation results are effective only if planned in terms of the stated objectives which are determined prior to the implementation of the program. For meaningful results, evaluation plans should include ways for evaluating the specific and ultimate goals of the program, the identification and placement program, the organizational approaches used for instructional purposes, the instructional materials and methods used, the motivating and counseling techniques, the total growth of participating individuals, the general climate of the school, and the attitudes reflected by nonparticipants toward the program.

Subjective Evaluation Methodologies

The sixth assumption – that important decisions about desirable education for the academically gifted must be based on philosophical considerations and value judgments resulting from rational thought – may be supported by the application of carefully thought-out process evaluations. The usefulness of such subjective and judgmental guidelines lies in the comprehensiveness of their design and in the logic used in the organization of questions.

Checklists are available to schools and school districts as aids in appraising the breadth and the quality of effort in the provision of educational opportunities for gifted students (see the appendix to this chapter). Such instruments have great value as agendas for discussion and as reports on the extensiveness of efforts that a school or school district is applying to the improvement of programs for talented minors.

An additional scale developed by Renzulli (1967) and adapted for use in this chapter – see Chart C – has, as may be noted, been applied in several California school districts. The application of this instrument is heavily dependent upon the expert qualities of the examiner and the clear definition of terms describing the parameters. Such categories as philosophy and objectives, general staff orientation, student identification and placement, curricula, and the teacher are rated according to their effects upon the outcome of the educational programs. Evaluators include specialists inside and outside school systems who have demonstrated expertness in the administration of differential education for the gifted.

In summary, this section has briefly outlined the strategy of evaluation that may be generalizable in the appraisal of many kinds of gifted programs in order to document their feasibility as well as their utility.

PART TWO
THE WORK OF ASSESSING CHARACTERISTICS OF THE GIFTED

As might be implied from all that has preceded this chapter, meaningful evaluation of gifted learners and the programs designed for them must necessarily take a different route from that of the evaluation of regular students and programs. With regard to the gifted student, we already know of his exceptional academic talents; there is little need, therefore, to assess those any further than an initial identification and a possible check. We must assess the

Chart C
EVALUATION SCALES FOR DIFFERENTIAL EDUCATION FOR THE GIFTED*
RESPONSES FROM SEVEN SCHOOL DISTRICTS IN CALIFORNIA
Summary Form

	IDEAL	SUPERIOR	COMMEND-ABLE	NEUTRAL	NEGATIVE
PHILOSOPHY AND OBJECTIVES					
Existence and adequacy of a document	$B_1B_3O_1$	O_2 W A	P_1P_2	B_2	
Application of a document	B_1B_3	$O_2P_1P_2A$	O_1W		B_2
GENERAL STAFF ORIENTATION					
System-wide support		$O_2O_1P_2$ W A	$B_1B_2P_1$		B_3
STUDENT IDENTIFICATION AND PLACEMENT					
Validity of conception and adequacy of procedures	$B_1B_2B_3$ P_2	$O_1O_2P_1$ W A			
Appropriateness of relationship between capacity and curriculum	B_1B_3	$O_1O_2P_2$ W A	B_2P_1		
CURRICULUM					
Relevance of conception	B_1	P_2A	$B_2B_3O_1O_2$ P_1 W		
Comprehensiveness	B_2B_3	$B_1O_1O_2$ P_2 W A	P_1		
Articulation	B_3P_2	$B_1B_2O_1$ O_2P A		W	
Adequacy of instructional facilities	$B_2B_3P_2$ A	$B_1O_1O_2$ P_1	W		
TEACHER					
Selection		B_3P_2 A	$B_2O_1O_2$ P_1 W		
Training		P_2 A	$B_1B_2B_3O_1$ O_2P_1 W		

LEGEND

Directors of programs for mentally gifted minors		Outside Independent evaluators	District B,
A	O_1	O_2	B_1 Resource teacher program
B			B_2 Enrichment teacher program
W	P_1	P_2	B_3 Acceleration program
X			
Y			

*Adapted from the chart shown in "Designing an Instrument for Evaluating Programs of Differential Education for the Gifted," by Joseph S. Renzulli (1967). See the Selected References.

learners, instead, on those characteristics that will influence decisions regarding their educational programs. These characteristics will be the higher-order achievements, cognitive skills, and affective behaviors which, in general, set these young persons apart from most of their contemporaries.

A similar restraint also holds regarding the evaluation of programs designed for the gifted; that is, since rote and drill will be emphasized to a lesser degree, we need not be concerned with the results of such curricular devices. We must, instead, evaluate the educational programs in terms of those outputs which should have been carefully planned into the course of instruction (see Chapter II concerning such outputs).

Pupil Evaluation and Program Evaluation in the Education of Talented Minors

Depending upon which evaluative information is desired, two sound methods of evaluation via normed test instruments are available. While the first method, pupil assessment, is more common and yields more reliable information, the second method, program assessment, offers the advantages of time and money savings.

Pupil Assessment

When test instruments appropriate to evaluating gifted learners are selected and procured, the standard method of test administration is to administer the tests to all the children in the program. Such a testing procedure will yield information for decision making about pupils and about the program.

Having test-score information for each pupil, one can then reach individual decisions regarding such questions as promotion, prediction, or need for counseling or special attention. Secondly, class means can be compared among programs for the gifted so that decisions regarding relative efficiency of the programs can be made. Historically, educational evaluation has derived from this type of individual assessment. When the program itself is the object of assessment, however, the pupil-assessment approach is not efficient.

Program Assessment

While the pupil-assessment approach yields program assessment as a natural by-product, program-assessment procedures can be aimed specifically, with consequent reductions in time and expense. If assessing the program is the main concern, then individual pupil assessment may very well be slighted or foregone without harm to

the assessment of the program. We can bypass pupil assessment by not testing all pupils with all tests.

The practical problems of educational research and evaluation often prohibit the utilization of pupils for more than a short period of time, and this is especially true in the case of special programs. These problems, however, do not seriously interfere with the testing of many pupils. The issue in these cases is not that administering some tests to some learners will provide better estimates of program evaluation than will other procedures; rather, that this mode can be *used* and that valuable evaluation data can be collected. Sampling of tests and pupils not only permits more efficient data collection but also allows the educational researcher to do things not otherwise possible.

Given a program-evaluation testing problem, a known number of test instruments with which to assess selected goals, and a known number of learners in the program, we can separate the pupils into several representative groups and administer some of the tests to each group. Provided that the subgroups of learners are not so small (less than 30) that mean scores might become unreliable or that sampling cannot be representative, nothing is lost with this testing and pupil-sampling procedure, except having complete information on each individual pupil. Inferences may still be made about the program being evaluated.

In the sampling of tests and pupils, our main concern involves each sample's representativeness of the pupil population. Since most evaluations of the sort under consideration will use only a class, a school, or a school district as the population of concern, problems of representativeness will be great. If the population of pupils is large enough, representativeness of the samples can be well approximated randomly. If the population is small, the sampling may have to be stratified; that is, each particular type of learner is represented in each sample approximately by proportion, according to age, race, sex, and the like.

If samples of learners, appropriately chosen, number more than about 30, confidence can be exercised that the mean achievement score for the sample is very close to that for the whole population (if the whole population had been tested). The larger the size of the sample, the more confidence one may have in the accuracy of estimation of the mean score; but beyond approximately 100 pupils, returns in increased accuracy are marginal. The reader interested in pursuing this line of reasoning may find the sections on the "standard error of the mean" in introductory statistical books and

textbooks to be of value. For specific program content developed for the gifted, the reader is referred to contemporary literature on talented minors; for example, the publications made available through California Project Talent.[1]

Frequency of Test Administration

Since test scores are of value only insofar as they supply some educational decision maker with information enabling him to make better decisions, tests should be administered before information is needed for decision making. Depending upon whether the evaluation has to do with a unit, a curriculum, or a program, the testing for achievement is logically scheduled near the conclusion of the instructional sequence. Testing near the conclusion of the program is characteristic of program assessment; not so, however, with pupil assessment, wherein diagnostic or predictive assessment might well take place near the beginning of instruction.

Characteristics of Standardized Tests for the Gifted

Complete, critical evaluations of all tests available for use at the elementary school level have been made and compiled by Hoepfner and his colleagues (1970) at the University of California, Los Angeles. By extrapolating to the secondary level, personnel who are charged with evaluating programs for gifted children and youth in the public schools should find these evaluations, with their identifications of test strengths and weaknesses, of primary interest.

The test evaluations in that document are keyed to the objectives of the program; that is, all tests are categorized not by the publisher or author but by the educational objective they assess. Thus, the evaluator uses the tests as tools, not as the subject of interest, and this is indeed the proper use. The "tools," therefore, are meaningfully keyed to program objectives. The following paragraphs briefly describe the characteristics of published tests for the higher-level aspects of achievement, cognitive skills, and affective behaviors, in that order.

Higher-Order Achievement Tests

Inasmuch as achievement is relative to content, each content area, in alphabetical order, is treated here. Emphasis is limited to those

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[1]Published by the California State Department of Education. See the Selected References in this document for complete bibliographical information on California Project Talent publications.

higher-order achievements relevant to the education of the gifted. For further explanation of the rationale behind the selection of objectives and test evaluation, see Hoepfner et al. (1970).

Arts and crafts. Higher-level aspects of objectives of arts-and-crafts programs include (1) appreciation of arts and crafts; (2) representational skill in arts and crafts; and (3) expressive skill in arts and crafts. Few tests are available that assess adequately any of these aspects. In general, the tests uniformly fail to measure any range (breadth) of relative skills or achievements in these areas; the tests, moreover, are rather poorly normed and are of low reliability. At this stage of educational measurement, it seems that expert or professional judgment of the products of students is just about the best way to assess these achievements, although in theory it is not the best way possible.

Foreign languages. Objectives of foreign language programs that are most appropriate to evaluations of programs for the gifted include (1) reading comprehension of a foreign language; (2) aural comprehension of a foreign language; (3) speaking fluency in a foreign language; (4) writing fluency in a foreign language; and (5) cultural insight through a foreign language.

At present, tests for all of the foreign language objectives are faulty in terms of their norming. With a limited demand upon such assessment devices and with the recent increase in foreign language training, one can see why such tests have not been normed well in the past; but one can also expect great strides to be made in this direction in the near future. It might be added that most of the tests now available are the products of very careful and thorough analysis of the educational objectives.

Language arts. While certain of the content of programs in the language arts is not thought of as related to programs for the gifted, two objectives definitely deserve consideration: (1) written expression; and (2) independent application of writing skills. Few published tests are currently available to assess these skills. This situation is probably due to the fact that such tests are not amenable to the desired answer-sheet format. Nationally used tests of such writing skills would require a monumental scoring system; it generally rests, therefore, with the program evaluator to obtain expert judgments of such skills and to work hard to maintain reliability and relevance to the program's objectives.

Mathematics. Two aspects of mathematics education seem quite relevant in and of themselves in programs for gifted learners. These

are: (1) independent application of mathematical skills; and (2) measurement reading and the making and taking of measurements. These objectives must be considered creative in part, because most students must generalize these skills from their training. Tests for the second objective tend to be of superior quality, with excellent validity and a high degree of technical precision.

Music. As one of the arts, music would appear to be a "natural" for inclusion as an objective of programs for the gifted, but not all aspects of a music education are truly for the gifted. Those aspects calling for extra consideration include (1) music appreciation; and (2) musical instrument playing. Unfortunately, no tests are available to assess these aspects of a music program in a standardized and technical manner. Once again, especially for the second objective, we must resort to expert judgments as our only guides at the present time. This is, in fact, the manner in which creativity is judged generally in our society – in other words, by experts or others of similar talent, and by the public who pays to enjoy the product.

Physical education, health, and safety. With the possible exception of the controversial subject of sex education, most programs pertaining to physical education, health, and safety impart basic skills and knowledge, with little in the way of objectives fitting uniquely into a program for gifted learners. In any event, most tests in these areas suffer greatly from poor coverage and from meagerness of technical excellence.

Reading. Aspects of reading instruction that appear appropriate to programs for the gifted include (1) inference making from the reading of selections; (2) recognition of literary devices; (3) critical reading; (4) attitude and behavior modification from reading; and (5) familiarity with the standard literature. While several published test instruments purport to measure these aspects of reading programs, careful analysis of most such tests indicates that they resort to measuring little more than the standard word-recognition skills (with a little short-term memory thrown in). Recently published tests, however, are encouragingly pointing to increased potential in such assessment.

Science. While a great many programs for talented minors have much to say regarding science training and while a growing number of educators and other persons perceive that creativity and giftedness in the sciences are society's only salvation, specific science objectives are rarely specified. Those objectives laying best claim to a gifted program are the following: (1) observation and description in

science; (2) classification and generalization in science; (3) hypothesis formation in science; (4) operational definitions in science; (5) experimentation in science; (6) formulation of generalized conclusions in science; (7) science interest and appreciation; and (8) application of scientific methods to everyday life.

Measurement devices for these important objectives lag far behind the curricula and programs available for teaching them; indeed, only a very few tests assess them at all. The tests that are presently available, however, are promising, inasmuch as they have generally arisen from intensive programs in science education.

Social sciences. Programs for the gifted have been generally strong in the social sciences, particularly in the following areas of study: (1) knowledge of governments; (2) knowledge of socioeconomic geography; (3) cultural knowledge; and (4) research skills in social sciences. There are a few tests that assess achievement in these areas. They are of uncommonly high quality, their greatest assets being appropriateness and usability of the instruments.

Higher-Order Cognitive Skills

Planners of programs for gifted children and youth are more in agreement in the area of cognitive skills than they are in the area just discussed. These planners have proceeded to develop many different programs with specific objectives in view. Only a very small number of the cognitive skills seem inappropriate to programs for the gifted.

Reasoning. Most educators perceive the reasoning processes as those by which the gifted student takes specific units or details of knowledge he has learned and uses and applies them. The basic varieties include (1) classificatory reasoning; (2) relational-implicational reasoning; (3) systematic reasoning; and (4) spatial reasoning. The quality of tests for these aspects of reasoning ranges from very good to very bad. Measures in these categories include the best published tests available but also some of the worst. It appears that there is a close relationship between the newness of the instrument and its validity, utility, appropriateness, and technical excellence.

Creativity. While creativity hangs over all programs for the gifted and, indeed, while it nearly constitutes some programs, carefully stated program objectives pertaining to this cognitive skill are scarce. Objectives appropriate for gifted programs include (1) creative flexibility; (2) creative fluency; (3) sensitivity; and (4) originality. Although a monumental amount of research has gone into the

construction of creativity programs and of assessment devices, this effort is not reflected in the quality of tests available to assess the objectives of a creativity program. It seems that an unnecessary balance has been struck: those tests well normed and reliable are not very valid, while those tests appearing most valid have been poorly normed and tend toward unreliability.

Memory. Memory skills seem to form a foundation for what is called gifted behavior. As such, to assess the memory process in groups of gifted students would appear to be needless, since all such learners possess great amounts of some kind of it. Suffice it to say that most memory tests available are aimed at pathological or defective groups and therefore have even less claim for use in evaluating programs for the gifted.

Higher-Order Affective Behaviors

Although of prime importance in the education of talented minors, who are frequently subject to affective disturbances (caused by hostile environments), education for specific affects is hotly debated. Whether we can or even should educate for affective behavior is questionable. And yet most educators, administrators, and parents believe that education should cover the student's affective behaviors. (See the Ward chart in Chapter II.) It is with this need in mind that the affective objectives are discussed here.

Personal temperament. The individual's personality, independent of social interactions, is the subject of the following objectives: (1) shyness-boldness; (2) neuroticism-adjustment; and (3) general activity-lethargy. Almost uniformly, tests for these characteristics of personal temperament are poorly normed, unreliable, and inclusive of only a very few aspects of the relevant behavior domain. It is very unlikely, at the present time, that adequate assessment of personal temperament can be part of an evaluation of a program for talented minors. Thus far, the best instruments for measuring temperament are those that have been developed for mental retardates. A second type of instrument includes normal developmental stages. The Meeker-Cromwell Evaluation Scale (1970), an instrument of this type, is still in the process of validation.

Social temperament. A similar judgment regarding test instruments holds for objectives of social temperament; for example (1) dependence-independence; (2) hostility-friendliness; and (3) socialization-rebelliousness.

Attitudes. Under the assumption that programs for the gifted can realize their highest payoff if basic attitudes are developed, most sets

of program goals list aspects of attitude development related to (1) school orientation; and (2) self-esteem. It is perhaps because these concepts are not well defined that most measures applied to them seem inadequate. These are very unstable concepts, and the organizer of a program for the gifted should be careful in specifying them as objectives. Semantic differential tests used in the evaluation of attitudes are very complex.

Interests. A broad range of interests is commonly deemed a meaningful objective of programs for talented minors. Measures of interests vary greatly, and the educational evaluator should choose most carefully among available measures so that the chosen instrument will accurately assess those areas of interest that are under consideration.

The Most Meaningful Kind of Evaluation for Gifted Youth

In the final analysis, the evaluation that has the most meaning, both for the schools and for the gifted student, is that which contributes toward a well-spent life. When the life of a person who took part in an educational program for the gifted is aborted by disease or by suicide, either of which could have been prevented had education been complete, then questions about the effectiveness of evaluation become serious. Out of the original 1,528 Terman students (Terman and Oden, 1947, 1959), if suicide became a frequent occurrence, then the need for evaluation takes on even more vital importance. In his paper "Suicide Among the Gifted," given at the University of California, Los Angeles, in October of 1970, Edwin Shneidman (1971)[2] found that among the Terman subjects (1) suicide could have been predicted by age twenty; and (2) the most predictive index, among males, was a malignant father (dead or alive) and a rejecting or nurturing wife. Dr. Shneidman concluded: "Giftedness is neither necessary nor sufficient for successful utility of potential, but significant others [factors of intellect and personality] – self-concept and the ability to deal comfortably with perturbation – are."

It is mandatory, then, that in educating gifted children and youth, the schools seek roles beyond the usual one that is concerned with academic achievement. The schools must also prepare the talented minor for adjusting to stress, for developing feelings of self-worth,

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[2]Dr. Shneidman is Professor of Medical Psychology at the Neuropsychiatric Institute, School of Medicine, University of California, Los Angeles. His 1970 paper was printed as a journal article in 1971; see the Selected References.

and for sustaining a conviction that life is worthwhile despite the tragedies and the shortcomings of man. In some instances, someone in the school may have to be the "significant other" factor that provides a balance in the young life of a gifted boy or girl.

CONCLUSION

It seems unfortunate that this chapter should end on a dismal note; but critical evaluation reveals the poor state of the assessment instruments that have been used and are still being used in the education of our gifted young. This situation has been exposed rather frankly in the hope that educators and evaluators will be alerted to the all-too-numerous pitfalls in the assessment of programs for very able learners. These pitfalls can best be dealt with (1) by carefully specifying program objectives, as described herein and in other materials relating to this project on the gifted; and (2) by employing the most efficient evaluation techniques and analyses with the greatest possible caution. The practitioner's diligent efforts at program planning, program implementation, and program evaluation will, in time, result in a more favorable prognosis for the depth and scope of our knowledge of education for the gifted. In practice, a meaningful framework must of necessity precede adequate evaluation tools.

It is the committee's opinion that a supplementary annotated bibliography on evaluation and evaluative methods and instruments would be useful in the education of talented minors; such a supplement is strongly recommended. The committee also recommends that the bibliography be organized according to the objectives identified for the gifted – for example: (1) tests publishable for each grade level and covering major subject-matter areas; and (2) tests separated on the basis of grade level, academic and higher cognitive levels, and so forth.

The appendix that follows, derived from a contemporary program for the gifted in a California school district, may be helpful to practitioners.

Appendix to Chapter V
EVALUATION ON THE BASIS OF CONTENT ONLY

(This covers academic tests available to the district.)

MANHATTAN BEACH CITY ELEMENTARY
SCHOOL DISTRICT – GIFTED PROGRAM

EVALUATION OF EDUCATIONAL EXPERIENCES PLANNED FOR THE GIFTED*

Curriculum and Subject-Matter Skills

Pupil	Grade
Teacher	Date

Part I

Cognition (comprehending)

	Do not know 0	Very low 1	Low 2	Medium 3	High 4	Very high 5
Mathematics						
Comprehension of mathematical principles						
Language usage and literature						
Vocabulary recognition						
Vocabulary meaning						
Reading for fact finding						
Comprehension of the major theme						
Science						
Ability to comprehend facts or principles						
Music						
Interest or desire to participate in:						
Use of rhythm instruments _____						
The writing of music _____						
The playing of music _____						
Dancing _____						
Listening _____						
Social sciences						
Ability to grasp materials						
Art						
Learning basic facts in:						
Art forms _____						
Composition _____						

*Adapted for use in this publication with permission of Manhattan Beach City Elementary School District. Instructions for yearly evaluations may be obtained from the District office (1212 Laurel Ave., Manhattan Beach, California 90266) upon request.

	Do not know 0	Very low 1	Low 2	Medium 3	High 4	Very high 5
Art (continued)						
Learning basic facts in:						
Colors						
Harmony						
Textures						
Appreciation and interest						
Foreign language (if offered)						
Ability to comprehend vocabulary						
Memory (retention and knowledge) with respect to presented material						
Mathematics						
Mastery of required skills for that grade level						
Accuracy of computation in rote drills						
Language usage and literature						
Spelling in daily writing						
Punctuation						
Science facts						
Music						
Social science facts						
Art						
Evaluation skills (analysis, synthesis)						
Mathematics – word problems						
Correct selection of procedures for solution						
Language arts and literature						
Ability to abstract significant information						
Ability to generalize from major theme to related work						
Science						
Ability to select correct principles						
Ability to apply learned principles						
Social sciences						
Ability to select correct principles						
Ability to apply learned principles						
Group interaction						
Group leadership						
Music						
Ability to discriminate tone value						
Convergent production skills (application)						
Mathematics – word problems						
Correct solution arrived at when different processes are necessary						

	Do not know	Very low	Low	Medium	High	Very high
	0	1	2	3	4	5
Language arts, usage, reading						
Contributions from independent reading						
Expressing ideas:						
In written material						
In oral presentations						
Science						
Independent research (assigned)						
Application of principles to projects						
Social sciences						
Independent research (assigned)						
Application of principles to projects						
Music						
Playing an instrument						
At home _____						
In the band _____						
Art						
Using colors, textures, and the like, as taught						
Divergent production (creativity, synthesis, application, critical thinking)						
English usage and literature						
Volunteer efforts at creative writing						
Use of original ideas in assignments						
Use of original ideas in speech						
Interest in adapting literature to class productions						
(No mathematics)						
Science						
Interest in independent projects (manual)						
Interest in researching independently (intellectual)						
Ability to see implied usages of known principles						
Social sciences						
Problem-solving techniques						
Skills in implementation of these techniques						
Interest in research outside of school						
Music						
Ability to compose music or lyrics						
Ability to play one or more instruments by ear						
Art						
Original ideas and efforts						
Physical education						
Unusual ideas for games and individual play						

Part II

Special skills useful for future achievement

Evaluation of the pupil's level of competency

	Adequate	Inadequate	No exposure
A. Library skills			
Familiarity with coding systems			
Independence in finding references			
Ability to abstract information from references			
Ability to organize this information			
Ability to outline			
B. Typing			
C. Speed reading			
D. Familiarity with mathematics of simple computer language			
E. Pupil's understanding of the basic vernacular language in his own special interest area or vocation			
F. General ability to classify materials			
G. Ability to draw correct inferences and implications			

Part III

Social, attutudinal, and emotional growth

	Adequate	Inadequate	No exposure
A. Ability to work independently			
B. Motivation toward school attendance			

C. Role preference – does he

	Yes	*No*
volunteer responsibility?	___	___
accept leadership?	___	___
prefer working alone?	___	___

D. Social preference:

	In school work	*In social situations*
Being a loner or having no friends	_____	_____
Having a few friends	_____	_____
Belonging to a large group	_____	_____

E. Physical skills: Excellent ___ Average ___ Poor ___ Not interested ___

Part IV

Motivation, interest, and talent

A. Does the child seem to enjoy reading? at home? Yes ___ No ___ at school? Yes ___ No ___

B. Does the child have a high interest in mathematics? Yes ___ No ___
Is accelerated placement recommended? _____
Is he turning away from mathematics Yes ___ No ___
Why do you think he is? _____
Any other subject? _____

C. Does he spend time at home on diverse art projects? Yes ___ No ___
Does he enjoy this time? Yes ___ No ___
Does he show exceptional motor skills in model building? – Sewing or knitting [for girls]? Yes ___ No ___
Does he manifest interest in chemical or radio sets? Yes ___ No ___

D. Is he highly inquisitive and curious about how things work? Yes ____ No ____
E. Is he oriented toward social sciences? Yes ____ No ____
F. Does he have other talents? Yes ____ No ____
Yes ____ No ____

Comments: _____

_____

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